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ASCENSION ISLAND, SOUTH ATLANTIC

RANGE REFERENCE ATMOSPHERE
0-66 KM ALTITUDE

JANUARY 1984

METEOROLOGY GROUP
RANGE COMMANDERS COUNCIL

WHITE SANDS MISSILE RANGE
KWAJALEIN MISSILE RANGE
YUMA PROVING GROUND

PACIFIC MISSILE TEST CENTER
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FOREWORD

Atmospheric parameters are essential to the research and development of missiles and aerospace vehicles. In the early 1960's, the need was recognized for realistic atmospheric models derived in a consistent manner for each of the several major test ranges. An atmospheric model derived from statistical data for a particular geographical location is referred to as a reference atmosphere.

The first Range Reference Atmosphere (RRA) was issued in 1963 by the Inter-Range Instrumentation Group (IRIG) for Cape Kennedy, Florida, and was followed by additional publications for several ranges up to 1974. Since that time, improved upper air data bases have become available from which to develop the RRA. These resulted from the extended period of records and from improvement in the upper air measuring program by rocketsondes for altitudes above the rawinsonde ceiling of 30 km. Revised and improved RRAs are justified for the following reasons:

1) Needs for more definitive statistical atmospheric models have arisen because of changes and advances in aerospace technology. The Space Transportation System (Space Shuttle) is one example.

2) Most ranges now have an extended and improved upper air data base from which to develop a more definitive RRA.

3) There are requirements for RRAs for new ranges and range sites.

4) There have been scientific advances in understanding the upper atmospheric structure and physical relationships.

5) Advances in statistical modeling techniques have been made because of the general availability of high-speed electronic computers. These have led to the adoption of advanced concepts in atmospheric modeling.

For these reasons, the Range Reference Atmosphere Committee (RRAC) was tasked by the Range Commanders Council Meteorology Group (RCC MG) to establish new and improved RRAs. The purpose, scope, and objectives of this task are outlined in the following paragraphs.

Purpose: This committee, Task MG-1, establishes RRAs for the several ranges as provided by the RCC. An RRA is a model of the Earth's atmosphere over a geographical location of interest, for use by DOD and other U.S. Government range users. The RRA is used to provide planning data for evaluating environmental constraints for the particular configurations of environment-sensitive systems and components being developed or undergoing tests.

Scope: Using the best available upper atmosphere data base to include rawinsonde, rocketsonde and possibly other high-altitude data sources for the range location, the task is to establish a model of certain statistics for wind and thermodynamic quantities derived in a uniform manner and published in a standardized format.

Objectives: The wind statistics shall be, insofar as practical, modeled to be consistent with rigorous mathematical probability properties of the multivariate normal probability theory. The thermodynamic quantities statistics shall be, insofar as practical, modeled to be consistent with the hydrostatic equation, the equation of state, and the probability principles that are related through these physical equations. The document shall serve as an authoritative source of information and as an atmospheric model for a particular range. The first in the series of revised RRAs to be published is for Kwajalein Missile Range (KMR) (publication date December 1982). The altitude range required for KMR is 0 to 70 km. The order of priority for the subsequent publications is:

	Range	Altitude Range Required
1.	AFFTC/Edwards AFB, CA	0 - 70 km[a]
2.	ESMC/Cape Canaveral AFS, FL	0 - 70 km
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4.	WSMR/White Sands, NM	0 - 70 km
5.	PMTC/Point Mugu, CA	0 - 70 km
6.	UTTR/Dugway (Michael AAF), UT	0 - 30 km[b]
7.	AD/Eglin AFB, FL	0 - 30 km
8.	ESMC/Ascension Island	0 - 70 km (Terminates at 66 km because of insufficient data)
9.	NASA/Wallops Flight Center, VA	0 - 70 km
10.	Taquac (Guam)	0 - 30 km
11.	PMTC/Barking Sands, HI	0 - 70 km

In keeping with the RCC's objective of standardization, the modeling techniques, basic text, and tabulation format are to be the same for all RRAs. These new and revised RRAs present not only the mean values of the thermodynamic quantities (pressure, temperature, virtual temperature, and density), but also include statistical measures for the dispersion (i.e., standard deviations and skewness coefficients). New quantities presented are water vapor pressure and dewpoint temperature. The statistical modeling for the wind is entirely new. The new approach uses the properties of the bivariate normal probability distribution function.

---

a. Use rocketsonde data from PMTC/Point Mugu for altitudes above 30 km.
b. Consider augmenting data base from Ely or Salt Lake City.

All final computations were performed by the United States Air Force Environmental Technical Applications Center (USAFETAC) in response to a task from Eastern Space and Missile Center (ESMC).

The text was prepared jointly by USAFETAC and the NASA/George C. Marshall Space Flight Center's Space Sciences Laboratory, Atmospheric Sciences Division. The editing and preparation of the draft manuscript were performed by the NASA/MSFC organization.

The cochairmen express their gratitude to all RRAC members and their respective colleagues who have made significant technical contributions to the establishment of these RRAs.

Special thanks are tendered to Lt. B. Novograd for his dilligence in forming the many computations and the development of the primary tables, I through IV. Special thanks goes to Lt. F. Wirsing for editing and formulating the equations for the derivable thermodynamic equations. These gentlemen performed this outstanding work under the direction of Major B. Lilius, USAFETAC.

Grateful acknowledgment goes to Mrs. Annette Tingle, NASA/MSFC, for editing the draft manuscript.

The RRAC consists of representatives from the U.S. Air Force, U.S. Army, National Aeronautics and Space Administration, U.S. Navy, and National Oceanic and Atmospheric Administration. The committee members for the RRA for the first publication are:

G. G. Boire, WSMC
O. H. Daniel, ESMC
R. de Violini, PMTC
F. G. Finger, NOAA/NWS
E. E. Fisher, HQ AFSC
B. R. Hixon, PMTC
J. M. Hobbie, KMR
E. J. Keppel, AD
S. F. Kubinski, WSMR
F. J. Schmidlin, NASA/WFC

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Cochairman, NASA/MSFC	Cochairman, USAF/ETAC

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RANGE REFERENCE ATMOSPHERE
0-66 KM ALTITUDE

January 1984

Prepared by

Range Reference Atmosphere Committee
Meteorology Group
Range Commanders Council

Published by

Secretariat
Range Commanders Council
White Sands Missile Range, New Mexico 88002

TABLE OF CONTENTS

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LIST OF ORGANIZATION ACRONYMS

AD	Armament Division
AFFTC	Air Force Flight Test Center
AFSC	Air Force Systems Command
AFSC/AFGL	AFSC/Air Force Geophysics Laboratory
AFSC/SD	AFSC/Space Division
AFSCF	Air Force Satellite Control Facility
AFTFWC	Air Force Tactical Fighter Weapons Center
AWS	Air Weather Service
BMD	Ballistic Missile Division
DOD	Department of Defense
DOE	Department of Energy
DOE/NTS	DOE/Nevada Test Site
DPG	Dugway Proving Ground
ESMC	Eastern Space and Missile Center
ETR	Eastern Test Range
KMR	Kwajalein Missile Range
NASA	National Aeronautics and Space Administration
NASA/MSFC	NASA/Marshall Space Flight Center
NASA/WFC	NASA/Wallops Flight Center
NOAA	National Oceanic and Atmospheric Administration
NWC	Naval Weapons Center
PMTC	Pacific Missile Test Center
USA/DTC	U.S. Army/Deseret Test Center
USAECOM	U.S. Army Electronics Command
USAFETAC	United States Air Force Environmental Technical Applications Center

UTTR	Utah Test and Training Range
WSMC	Western Space and Missile Center
WSMR	White Sands Missile Range
WTR	Western Test Range
YPG	Yuma Proving Ground
6585TG	6585th Test Group
TSCF	Targeting Systems Characterization Facility

FOREWORD

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O. E. Smith	Maj. B. W. Galusha
Cochairman, NASA/MSFC	Cochairman, USAF/ETAC

CHAPTER I. INTRODUCTION

A. Definition and Purpose of the Range Reference Atmosphere

A.1 Definition

A reference atmosphere is a statistical model of the Earth's atmosphere derived from upper air measurements over a particular geographical location. Hence, these Range Reference Atmospheres (RRAs) are atmospheric models developed by the Range Reference Atmosphere Committee (RRAC) in response to a task by the Range Commanders Council Meteorology Group (RCC MG) and published by the RCC Secretariat. The RCC MG, formerly called the Inter-Range Instrumentation Group/Meteorology Working Group (IRIG/MWG), published a series of RRAs during the period 1963 through 1974.

A.2 Purpose

A series of revised and expanded RRAs are to be published for locations of interest to the RCC. These publications are to serve as authoritative reference sources on certain upper air statistics and as atmospheric models for particular range sites. The technical usefulness of these documents for the ranges, range users, U.S. aerospace industries, and the scientific community is recognized because of the standardization of the development techniques and the presentation of the tabulations.

B. Scope of the Range Reference Atmosphere and Arrangement of Tables

B.1 Scope

The RRA contains tabulations for monthly and annual means, standard deviations, and skewness coefficients for windspeed, pressure, temperature, density, water vapor pressure, virtual temperature, and dewpoint temperature; the means and standard deviations for the zonal (U) and meridional (V) wind components; and the linear (product moment) correlation coefficient between the wind components. These statistical parameters are tabulated at the station elevation, at 1-km intervals from sea level to 30 km, and at 2-km intervals from 30 to 90 km. The wind statistics are given at approximately 10 m above the station elevations and at altitudes with respect to mean sea level thereafter. For those range sites without rocketsonde measurements, the RRAs terminate at 30 km altitude, or they are extended, if required, when rocketsonde data from a nearby launch site are available. There are four sets of tables for each of the 12 monthly reference periods and the annual reference period.

B.2 Arrangement of Tables

The statistical parameters for the RRA models are presented in four tables, as outlined in the following paragraphs.

Table I contains all the wind statistical parameters. This table gives the monthly and annual means and standard deviations of the U and V wind components and the linear (product moment) correlation coefficient between these

two components; the mean, standard deviation and skewness coefficient of the windspeed, and the number of wind observations (sample size).

Table II contains the monthly and annual means, standard deviations, and skewness values of pressure, temperature, and density, and the number of observations used for each of these thermodynamic quantities.

Table III contains the monthly and annual means, standard deviations and skewness values of the water vapor pressure, virtual temperature and dewpoint, and the number of observations for each of these moisture-related quantities. The statistical parameters for water vapor pressure and dewpoint terminate at 15 km altitude. Above 15 km the statistical parameters for virtual temperature are considered to be the same as those for temperature.

Table IV contains the monthly and annual mean atmospheric models for the thermodynamic variables: pressure, virtual temperature, and density. This table is derived from the monthly and annual mean virtual temperature versus altitude (geometric) using the hydrostatic equation and the equation of state. Also presented is the geopotential height corresponding to the tabulated geometric altitudes.

The physical unit for all wind parameters is meters per second. The physical unit for pressure is millibars; for temperature and virtual temperature, degrees Kelvin; for density, grams per cubic meter; and for water vapor pressure, millibars. In all cases the skewness coefficient and the correlation coefficient between wind components are unitless. All reference to altitude is geometric altitude and is expressed in kilometers. All reference to height is geopotential height and has the unit geopotential meters or kilometers. All geometric altitudes and geopotential heights are with respect to mean sea level.

C. Data Quality Control Procedures

A small portion (less than 10 percent) of the soundings in the data base used to calculate the RRA tables contained erroneous data values. The soundings which contained these erroneous values were eliminated from the data base using the following procedures:

1) Soundings containing gaps in their height data greater than 200 mb were rejected. This step was taken because some soundings only contained height values at their "mandatory" pressure levels, which were occasionally missing, resulting in soundings with no height information at all.

2) An initial set of RRA statistics was computed using all the remaining soundings. This initial set of statistics was used to determine data limits for the temperature, pressure, U and V components of the wind, and the dewpoint (for the 0- to 30-km portion of the RRA) or the density (for the 30- to 90-km portion of the RRA). The lower (upper) data limits were set at the mean value for a specific parameter, minus (plus) six standard deviations of that quantity. One pair of data limits was computed for each of these parameters: month of the year and data level.

3) This initial set of data limits was then used to screen the data base. All the soundings that contained values outside these data limits were rejected. A new RRA was then computed using the screened data base. This second RRA was used to generate a second set of data limits.

4) The second set of data limits was then used to screen the data base further. A new RRA was again generated. The skewness values in this RRA were then evaluated, according to empirical criteria specified in section II.A.3 of this document for the winds, and according to criteria in section III.A.3 for the thermodynamic quantities. If these criteria were satisfied, the new RRA was then used to generate a final set of data limits, which were used to control the quality of the data base for the final version of the RRA.

5) Occasionally, the third RRA that was generated did not satisfy all of the skewness criteria. This indicated that some incorrect values were still present in the data base. To complete quality control, steps 3 and 4 were repeated for additional iterations (usually one or two) until the resulting RRA satisfied the skewness criteria. At that point, a final set of data limits was generated. This final set of data limits was then used to control the quality of the data base and generate the final RRA.

D. Organization of the Chapters

Because there are plans to publish a series of RRAs, comments on the special organization of the document are in order. The RRA document is arranged in four chapters. Chapter I is the introduction. Chapter II, Wind Statistics and Models, contains the techniques used to arrive at the wind statistical parameters, table I, and the probability functions that are to be used as wind models to derive several wind statistics. Chapter III, Statistics of Thermodynamic Quantities and Models, contains the techniques used to arrive at the thermodynamic and moisture-related statistical parameters given in tables II and III and the atmospheric thermodynamic model presented in table IV. This chapter also contains sets of equations to calculate several atmospheric properties. Chapter IV contains the general conclusions and recommendations. These four chapters are reprinted without change for each documented RRA to assure consistency and for expediency in preparing the documentation. To account for variations particular to a specific RRA, two appendixes have been included. Appendix A, Examples of Wind Statistics, is designed to give a few illustrative examples of wind statistics for the specific RRA and cursory observations, comparisons, or comments on wind statistics. Appendix B, Range Specific Information, is designed to present specific information particular to the range, such as geographical location, data base, etc., and any cursory observations or comments on the thermodynamic quantities.

Read these appendixes! They are located as the last two units in the document because they may vary in length depending on the circumstances. Appendixes A and B and tables I, II, III, and IV are the only differences among the RRA documents published in this new RRA series.

CHAPTER II. WIND STATISTICS AND MODELS

A. General Considerations

A.1. Objectives

An objective of the RRA is to furnish minimum tabulation for the wind statistics. To meet this objective, the bivariate normal probability distribution was adopted as a statistical model for the wind treated as a vector quantity at the RRA data levels. Only five statistical parameters are required to completely describe this probability function. In Cartesian coordinates these parameters are the means and standard deviations of the two orthogonal components and the correlation coefficient between the two components. These five statistical parameters for the U and V (meteorological coordinates) components are given in table I. The statistical properties of the bivariate normal probability distribution are used to derive many wind statistics that are of interest to the ranges and range users. This procedure produces consistent wind statistics that are connected through rigorous mathematical probability functions. By using these functions, extensive tabulations of wind statistics are avoided.

The statistical properties of the bivariate normal probability distribution presented for the vector wind statistical model are:

1) The wind components are univariate normally distributed.

2) The conditional distribution of one component given a value of the other component is univariate normally distributed.

3) The windspeed is of the form of a generalized Rayleigh distribution.

4) The frequency distribution of wind direction can be derived.

5) The conditional distribution of windspeed given a value of wind direction (wind rose) can be derived.

6) The five tabulated wind statistical parameters with respect to the meteorological U and V coordinate system can be derived for any arbitrary rotation of the orthogonal axes.

The probability distribution functions and sets of equations to derive wind statistics for the previously stated properties of the vector wind model are presented in this chapter. Symbols used are summarized in table A. Illustrative examples are presented in appendix A. No attempt is made to give the derivation of the probability functions. The reader is referred to Smith (1976) for some derivations and several applications of the probability distribution properties for wind statistics.

A.2. Data Quality Control

The U and V components of the wind were used to generate data limits set at plus and minus six standard deviations from the mean for each of the

TABLE A. LIST OF SYMBOLS USED IN CHAPTER II

N - The number of wind measurements in table I

r - A general variable for the bivariate normal probability distribution in polar coordinates

R - A generalized Rayleigh variable used for derived windspeed probability distribution

R (U, V) - The linear (product moment) correlation coefficient between the zonal and meridional wind components in table I

SK (W) - Skewness parameter for windspeed in table I

S (U) - The standard deviation of the zonal wind component in table I

S (V) - The standard deviation of the meridional wind component in table I

S (W) - The standard deviation of windspeed in table I

t - A standardized normal variate used in text table B

U - The zonal wind component

UBAR - The mean value of the zonal wind component in table I

V - The meridional wind component

VBAR - The mean value of the meridional wind component in table I

W - Windspeed or modulus of wind vector, a scalar quantity

WBAR - The mean value of windspeed in table I

X - A general component variable or coordinate axis

Y - A general component variable or coordinate axis

$\bar{X}$ - A general component mean value in the [x,y] coordinate system

$\bar{Y}$ - A general component mean value in the [x,y] coordinate system

α (alpha) - Rotation angle for the [x,y] coordinate system

TABLE A. (concluded)

θ (theta) - Wind direction in the polar coordinate system

$\lambda_{(\ )}$ (Lambda) - A parameter in the bivariate normal probability distribution in text table C

ξ (Xi) - The mean value in the standardized normal probability distribution used in text table B

π (Pi) - Constant = 3.14159 ...

ρ (Rho) - The general linear correlation coefficient between the two component variables in the [x,y] coordinate system

σ_x, σ_y - The general standard deviations of the x and y component variables in the [x,y] coordinate system.

quantities. These data limits were used to screen the wind data base, as described in section I.C. The data base was considered to be free from errors under the following conditions:

1) The skewness of the windspeed was below 4.0 at data levels where the mean windspeed was less than 15 m/s, and

2) The skewness of the windspeed was below 2.5 at data levels where the mean windspeed was greater than 15 m/s.

A.3 Limitations

For the wind statistics, the correlation coefficients for like wind components and unlike wind components between altitude levels were not computed. Therefore, wind statistics with respect to altitude (profile) cannot be derived from the RRA statistics. For wind profile modeling techniques the user is referred to Smith (1976). However, the wind statistics at discrete altitudes are valid; all of the probability distribution functions given in chapter II can be derived from the five wind component statistical parameters contained in table I, and the derived distributions can be considered as wind models at discrete altitudes.

By convention, in the statistical literature Greek letters are used for population or theoretically known parameters, and sample estimates are denoted by English alphabetical letters or with a "hat" (^) over the Greek letters. In chapter II Greek letters are used for the variances and the linear correlation coefficient, and the means are denoted by $\overline{X}$ and $\overline{Y}$ when dealing with the bivariate normal distribution. It will always be understood that table I contains sample estimates of the statistical parameters and they are with respect to the meteorological U and V coordinate system.

B. Coordinate System and Computation of Statistical Parameters

B.1. Coordinate System

Wind measurements are recorded in terms of magnitude and direction. The wind direction is measured in degrees clockwise from true north and is the direction from which the wind is blowing. The wind magnitude (the modulus of the vector) is the scalar quantity and is referred to as windspeed or scalar wind. A statistical description that accounts for the wind as a vector quantity is appropriate and requires a coordinate system.

For the RRA the standard meteorological coordinate system has been chosen for the wind statistics, all tables of statistical parameters, and related discussions because the coordinate system used in aerospace and related applied fields has not always been consistent.

Using figure 1, the polar and Cartesian forms for the meteorological coordinate system are defined:

W = windspeed, scalar wind, or magnitude of the wind vector in meters per second.

θ = wind direction. θ is measured in degrees clockwise from true north and is the direction from which the wind is blowing.

U = zonal wind component, positive west to east, in meters per second.

V = meridional wind component, positive south to north, in meters per second.

The components θ and W define the polar form, and the U-V components define the Cartesian forms:

$$U = -W \sin\theta \quad , \quad 0 \leq \theta \leq 360° \tag{1}$$

$$V = -W \cos\theta \quad . \tag{2}$$

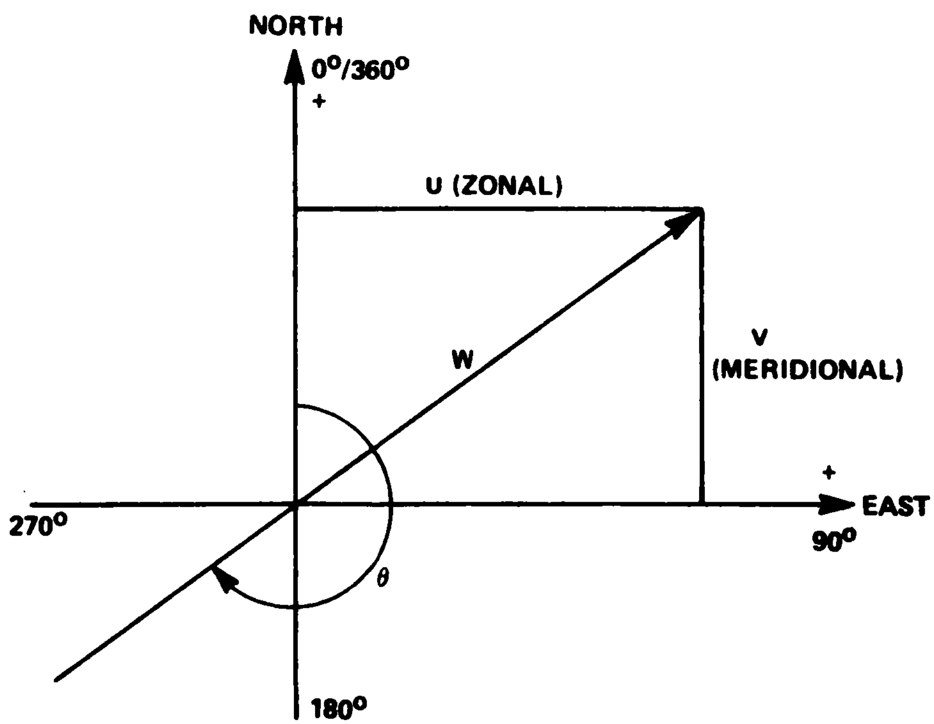

Figure 1. The meteorological coordinate system.

It is helpful to note the difference between the mathematical convention for a vector direction and the meteorological convention for wind direction:

$$\theta \text{ met} = 270 - \theta \text{ math} \tag{3}$$

when $0 \leq \theta$ math $\leq 270°$

$$\theta \text{ met} = 360 + (270 - \theta \text{ math})$$

when $270 \leq \theta$ math $\leq 360°$

B.2 Computation of Statistical Parameters

The wind statistical parameters in table I for the means and standard deviations of the U and V wind components and windspeed and the skewness parameter of windspeed were computed using the sums technique presented in chapter III.C.3. In addition, the linear (product moment) correlation coefficient between the U and V wind components, r (u,v) in table I, was computed. This correlation coefficient is defined as

$$r\ (u,v) = \frac{\sum_{i=1}^{n} (U_i - \bar{U})\ (V_i - \bar{V})}{N\ s(u) \cdot s(v)} \quad . \tag{4}$$

These statistical parameters are with respect to the Standard Meteorological Coordinate System.

C. Statistical Wind Models

C.1. Wind Component Statistics

The univariate normal (Gaussian) probability distribution function is used to obtain wind component statistics. In generalized notations, this probability density function (pdf) is

$$f\ (t) = \frac{e^{-\frac{t2}{2}}}{\sqrt{2\pi}} \quad , \tag{5}$$

where $t = X - \xi/\sigma_X$ is the standardized variate, with ξ defining the mean and σ_X the standard deviation. The probability distribution function (PDF) is

$$F(X) = \int_{-\infty}^{X'} f(t)\ dt \quad . \tag{6}$$

Because this integral cannot be obtained in closed form, it is widely tabulated for zero mean and unit standard deviation. For a convenient reference for the RRA, selected values of F(X) are given in table B. To emphasize the connotation of probability, F(X) is shown in table B as $P\{X\}$.

The t values in table B are used as multiplier factors to the standard deviation to express the probability that a normally distributed variable, X, is less than or equal to a given value as

$$P\left\{X \leq \text{mean} + t\ \sigma_x\right\} = \text{probability, } p \quad . \tag{7}$$

For example, when t = 1.6449, the probability that X is less than or equal to the mean plus 1.6449 standard deviations is 0.95. That value of X that is less than or equal to the mean plus 1.6449 standard deviations is called the 95th percentile value of X. Also given in table B are the numerical values to express the probability that X falls in the interval X_1 and X_2; i.e.,

$$P\left\{ X_1 \leq X \leq X_2 \right\} = \text{Interpercentile Range} , \tag{8}$$

where

$$X_1 = \bar{X} - t\ \sigma_x$$

$$X_2 = \bar{X} + t\ \sigma_x \quad .$$

For t = 1.9602 the probability that X lies in the interval X_1 and X_2 is 0.95. The values of X_1 and X_2 in this example comprise the 95th interpercentile range.

For a normally distributed variable, the mode (most frequent value) and the median (50th percentile value) are the same as the mean value. The means and standard deviations of the U and V wind components from table 1 are used in equations (7) and (8) to compute the percentile values and interpercentile ranges of the U and V wind components. When equation (7) is illustrated on a normal probability graph, a straight line is formed.

C.2. The Vector Wind Model

Because wind is a vector quantity having direction and magnitude that can be expressed as two components in an orthogonal coordinate system, a probability model that describes the joint relationship is the bivariate normal probability distribution. In general component notation, the bivariate normal probability density function (BNpdf) is

TABLE B. VALUES OF t FOR STANDARDIZED NORMAL (UNIVARIATE) DISTRIBUTION FOR PERCENTILES AND INTERPERCENTILE RANGES

t	P(X)	X	$P\{X_1 \le X \le X_2\}$ (%)
-3.0000	0.00135	$\xi - 3.0000\ \sigma$	99.73 (0.27)
-2.5758	0.00500	$\xi - 2.5758\ \sigma$	99 (1.00)
-2.3263	0.01000	$\xi - 2.3263\ \sigma$	98 (2.00)
-2.2365	0.01266	$\xi - 2.2365\ \sigma$	97.468 (2.532)
-2.0000	0.02275	$\xi - 2.0000\ \sigma$	95.45 (4.55)
-1.9602	0.02500	$\xi - 1.9602\ \sigma$	95 (5)
-1.6449	0.05000	$\xi - 1.6449\ \sigma$	90 (10)
-1.2816	0.10000	$\xi - 1.2816\ \sigma$	80 (20)
-1.0000	0.15866	$\xi - 1.0000\ \sigma$	68.268 (31.732)
-0.8416	0.20000	$\xi - 0.8416\ \sigma$	60 (40)
-0.6745	0.25000	$\xi - 0.6745\ \sigma$	50 (50)
-0.2533	0.40000	$\xi - 0.2533\ \sigma$	20 (80)
0.0000	0.50000	ξ	
0.2533	0.60000	$\xi + 0.2533\ \sigma$	
0.6745	0.75000	$\xi + 0.6745\ \sigma$	
0.8416	0.80000	$\xi + 0.8614\ \sigma$	
1.0000	0.84134	$\xi + 1.0000\ \sigma$	
1.2816	0.90000	$\xi + 1.2816\ \sigma$	
1.6449	0.95000	$\xi + 1.6449\ \sigma$	
1.9602	0.97502	$\xi + 1.9602\ \sigma$	
2.0000	0.97725	$\xi + 2.0000\ \sigma$	
2.2365	0.98734	$\xi + 2.2365\ \sigma$	
2.3263	0.99000	$\xi + 2.3263\ \sigma$	
2.5758	0.99500	$\xi + 2.5758\ \sigma$	
3.0000	0.99865	$\xi\ \ 3.0000\ \sigma$	

where $X_1 = \xi - t\sigma$
and $X_2 = \xi + t\sigma$

$$f(X,Y) = \frac{1}{2\pi\sigma_x\sigma_y\sqrt{1-\rho^2}}\left[\exp \frac{-1}{2(1-\rho^2)}\left\{\frac{(X-\bar{X})^2}{\sigma_x^2}\right.\right.$$

$$\left.\left. - \frac{2\rho(X-\bar{X})(Y-\bar{Y})}{\sigma_x\sigma_y} + \frac{(Y-\bar{Y})^2}{\sigma_y^2}\right\}\right] \quad -\infty \leqq X \leqq \infty \text{ and}$$

$$-\infty \leqq Y \leqq \infty \quad , \tag{9}$$

where the five parameters are $\bar{x},\bar{y}$, the component means; σ_x, σ_y, the component standard deviations; and ρ, the correlation coefficient between the two component variables, X and Y.

For many applications the interest is in determining the probability that a point $\{X,Y\}$ will fall within a contour of equal probability density. The exponential terms of equation (9), when set equal to a constant, λ^2, give a family of ellipses depending on the value of the constant. The ellipses have a common center at the point $\{\bar{X},\bar{Y}\}$. Integration of equation (9) over the region bounded by the contours of equal probability density gives

$$P(\lambda) = 1 - e^{\frac{-\lambda^2}{2(1-\rho^2)}} \quad . \tag{10}$$

Solving for λ^2 and replacing $P(\lambda)$ by p gives

$$\lambda^2 = -2(1-\rho^2)\ln(1-p) \quad . \tag{11}$$

Now define

$$\lambda_e = \sqrt{2}\sqrt{-\ln(1-p)} \quad . \tag{12}$$

For ready reference and comparisons, λ_e is shown in table C for selected values of p.

TABLE C. VALUES OF λ FOR BIVARIATE NORMAL DISTRIBUTION ELLIPSES AND CIRCLES

P(%)	λ_c (ellipse)	λ_c (circle)	P(%)	λ_c (ellispe)	λ_c (circle)
0.000	0.0000	0.0000	65.000	1.4490	1.0246
5.000	0.3203	0.2265	68.268	1.5151	1.0713
10.000	0.4590	0.3246	70.000	1.5518	1.0973
15.000	0.5701	0.4031	75.000	1.6651	1.1774
20.000	0.6680	0.4723	80.000	1.7941	1.2686
25.000	0.7585	0.5363	85.000	1.9479	1.3774
30.000	0.8446	0.5972	86.466	2.0000	1.4142
35.000	0.9282	0.6563	90.000	2.1460	1.5175
39.347	1.0000	0.7071	95.000	2.4477	1.7308
40.000	1.0108	0.7147	95.450	2.4860	1.7579
45.000	1.0935	0.7732	98.000	2.7971	1.9778
50.000	1.1774	0.8325	98.168	2.8284	2.0000
54.406	1.2533	0.8862	98.889	3.0000	2.1213
55.000	1.2637	0.8936	99.000	3.0348	2.1460
60.000	1.3537	0.9572	99.730	3.4393	2.4320
63.212	1.4142	1.0000	99.9877	4.2426	3.0000

$$\lambda_c = \sqrt{2}\,\sqrt{-\ln(1 - P)}$$

$$\lambda_c = \sqrt{-\ln(1 - P)}$$

The probability ellipse that contains p-percent of the wind vectors expressed in the most general form is the conic defined by

$$AX^2 + BXY + CY^2 + DX + EY + F = 0 \quad , \tag{13}$$

where

$$A = \sigma_y^2$$

$$B = -2\rho\sigma_x\sigma_y$$

$$C = \sigma_x^2$$

$$D = 2\sigma_x\sigma_y\ \rho\bar{Y} - 2\sigma_y^2\bar{X} = -\ (B\bar{Y} + 2A\bar{X})$$

$$E = 2\sigma_x\sigma_y\ \rho\bar{X} - 2\sigma_x^2\bar{Y} = -\ (B\bar{X} + 2C\bar{Y})$$

$$F = A\bar{X}^2 + C\bar{Y}^2 + B\bar{X}\bar{Y} - AC\ (1 - \rho^2)\ \lambda_e^2 \quad ,$$

and

$$\lambda_e = \sqrt{2}\ \sqrt{-\ \ln\ (1 - \rho)} \quad .$$

For graphical presentations, the range of the variable is important in order to arrange the scale. The largest and smallest values of X and Y for a given probability ellipse, p, are given by

$$X_{L,S} = \bar{X} \pm \sigma_x\lambda_e \tag{14}$$

$$Y_{L,S} = \bar{Y} \pm \sigma_y\lambda_e \quad , \tag{15}$$

where, as before, $\lambda_e = \sqrt{2}\ \sqrt{-\ln (1 - p)}$.

Although there are several approaches to graphing the probability ellipses, the following procedure is advantageous for electronic computer plotting. In establishing the computer plotting program, the sample estimates for $\overline{X}, \overline{Y}$, σ_x, σ_y, and ρ are constants in equation (13). The user makes the choice of probability ellipses desired. Thus, p in equation (12) is programmed as a parameter. The largest and smallest values for X and Y are computed by equations (14) and (15) for the largest probability ellipse selected. This sets the graphical scale. Values of X within the range of "X smallest" to "X largest" are obtained by incrementing X between these limits. Using the quadratic equation, a solution for Y of equation (13) is made and plotted for each value of X. The centroid $(\overline{X}, \overline{Y})$ for the family of probability ellipses is plotted as a point. Labeling and other identification complete the plotting program.

For a given probability, equation (13) defines an ellipse that contains p-percent of the points X,Y. Since the entire area under the bivariate normal density function [equation (9)] is unity, upon integration for a given probability ellipse, that given ellipse contains p-percent of the total area. In the wind statistics, p-percent of the wind vectors fall within the specified probability ellipse. From this point of view, a specified probability ellipse gives the joint probability that p-percent of the U-V components lie within the given ellipse.

When $\sigma_x^2 = \sigma_y^2 = \sigma^2$ and $\rho = 0$ in the bivariate normal distribution, the probability ellipses of equation (13) reduce to circles whose centers are at the means $\overline{X}, \overline{Y}$. The radii of the probability circles are $\sigma_{V1}\lambda_c$, where

$$\sigma_{V1} = \sqrt{2\sigma^2} \tag{16}$$

and

$$\lambda_c = \sqrt{-\ln (1 - p)} \ . \tag{17}$$

Values for λ_c for selected probabilities, p, are given in table C.

Because this function is simple, it can easily be graphed manually. However, the generalized plotting technique for electronic computer plotters, as represented by equation (13), can be advantageously used.

C.3. Derived Distributions for Wind Statistics

In this subsection the probability distribution functions and sets of equations are presented to derive certain probability distribution functions for wind statistics. These derived probability distributions are:

1) The conditional distribution of wind components

2) The generalized Rayleigh distribution for windspeed

3) The distribution for wind direction

4) The conditional distribution of windspeed given a wind direction (wind rose).

The required five statistical parameters for these derived distributions for wind statistics are given in table I.

C.3.1 The Conditional Distribution of Wind Components

Given that two random variables X and Y are bivariate normally distributed, the conditional distribution $f(Y|X)$ is read as $f(Y)$ given X, and likewise $f(X|Y)$ is read as $f(X)$ given Y. The conditional probability distribution function $F(Y|X)$ has the mean $E(Y|X)$ and variance $\sigma^2_{(x|y)}$, where

$$E(Y|X^*) = \bar{Y} + \rho\left(\frac{\sigma_y}{\sigma_x}\right)(X^* - \bar{X}) \tag{18}$$

and

$$\sigma^2_{(y|x^*)} = \sigma_y^2\,(1 - \rho^2) \quad . \tag{19}$$

The conditional standard deviation is

$$\sigma_{(y|x^*)} = \sigma_y\sqrt{1 - \rho^2} \quad . \tag{20}$$

By interchanging the variables and parameters, the conditional distribution function for $F(X|Y^*)$ has the conditional mean

$$E(X|Y^*) = \bar{X} + \rho\left(\frac{\sigma_x}{\sigma_y}\right)(Y^* - \bar{Y}) \quad , \tag{21}$$

conditional variance

$$\sigma^2_{(x|y^*)} = \sigma_x^{\ 2}\,(1 - \rho^2) \quad , \tag{22}$$

and conditional standard deviation

$$\sigma_{(x|y^*)} = \sigma_x \sqrt{1 - \rho^2} \quad . \tag{23}$$

The preceding conditional probability distribution functions are univariate normal distributions for a (fixed) given value for one of the bivariate normal variables. Thus, the t-values given in table B are applicable for conditional probability statements. For example,

$$F(Y|X^*) = E(Y|X^*) + t\sigma_{(y|x^*)} \quad . \tag{24}$$

For $t = 1.6449$ there is a 95 percent chance that Y is less than or equal to $\bar{Y} + 1.6449\ \sigma_{(y|x^*)}$ given that $X = X^*$. In symbols this statement reads

$$P\left\{ Y \leq E(Y|X^*) + 1.6449\ \sigma_{(y|x^*)}\ |X = X^* \right\} = 0.9500 \quad . \tag{25}$$

Interval probability statements can also be made; namely,

$$P\left\{ Y_1 = E(Y|X^*) - t\sigma_{(y|x^*)} \leqq Y \leqq Y_2 = E(Y|X^*) + t\sigma_y\ |X = X^* \right\}$$

where X^* can take on any fixed value of X, but a convenient arrangement is to let $X^* = \bar{X} \pm t\sigma_x$.

The close connection of the regression function of Y on X to the conditional mean for the bivariate normal distribution is noted; namely,

$$Y = \bar{Y} + \rho \left(\frac{\sigma_y}{\sigma_x} \right) (X - \bar{X}) \quad . \tag{26}$$

Similarly, the regression function of X on Y is

$$X = \bar{X} + \rho \left(\frac{\sigma_y}{\sigma_x} \right) (Y - \bar{Y}) \quad . \tag{27}$$

These are linear functions and express the same results as would be obtained from a least-squares regression line.

C.3.2. The Generalized Rayleigh Distribution for Windspeed

If two random variables, X and Y, are bivariate normally distributed, then the probability distribution for the modulus, R, can be derived in terms of the five parameters that define the bivariate normal distribution.

$$R = \sqrt{X^2 + Y^2} \tag{28}$$

The distribution of R so derived is called a generalized Rayleigh distribution because there are no restrictions on the parameters. For applications to the RRA, the variable R is recognized as windspeed or the modulus of the wind vector.

The probability density function for R is expressed as

$$f(R) = a_0 R e^{-a_1 R^2} \left[I_0(a_2 R^2)\, I_0(a_3 R) + 2 \sum_{k=1}^{\infty} I_k(a_2 R^2)\, I_{2k}(a_3 R) \cos 2k\psi \right] R \geq 0 \quad . \tag{29}$$

The functions $I_0(\cdot)$, $I_k(\cdot)$, and $I_{2k}(\cdot)$ are the modified Bessel functions of the first kind for zero order, kth order, and 2kth order. The coefficients are

$$a_0 = \exp\left[-\frac{1}{2}\left\{\frac{\bar{X}^2}{\sigma_a^2} + \frac{\bar{Y}^2}{\sigma_b^2}\right\}\right] \Big/ \sigma_a\sigma_b \quad ,$$

where σ_a^2 and σ_b^2 are the rotated variances to produce zero correlation between X and Y. σ_a and σ_b are the positive and negative roots[1] of the expression

$$\sigma^2_{(+,-)} = \frac{1}{2}\left\{\sigma_x^2 + \sigma_y^2 \pm \left[(\sigma_x^2 + \sigma_y^2)^2 - 4\sigma_x^2\sigma_y^2(1 - \rho^2)\right]^{1/2}\right\} \quad ,$$

$$a_1 = (\sigma_x^2 + \sigma_y^2)/4(1 - \rho^2)\ \sigma_x^2\sigma_y^2 \quad ,$$

$$a_2 = \frac{\left[(\sigma_x^2 - \sigma_y^2)^2 + 4\rho^2\sigma_x^2\sigma_y^2\right]^{1/2}}{4(1 - \rho^2)\ \sigma_x^2\sigma_y^2} \quad ,$$

$$a_3 = \left[\left(\frac{\bar{X}}{\sigma_a^2}\right)^2 + \left(\frac{\bar{Y}}{\sigma_b^2}\right)^2\right]^{1/2} \quad ,$$

---

1. This computational form is obtained from the determinant

$$\begin{vmatrix} \sigma_x^2 - K & \sigma_x\sigma_y\rho \\ \sigma_x\sigma_y\rho & \sigma_y^2 - K \end{vmatrix} \quad ,$$

where K is $\sigma^2_{(+,-)}$, and σ_a and σ_b are analogous to the standard deviation of the major and minor axes of the bivariate normal probability ellipse.

and

$$\tan \psi = \frac{\bar{Y}}{\bar{X}} \frac{\sigma_a^2}{\sigma_b^2} .$$

Since this density function cannot be integrated in closed form from zero to R, numerical integration is used to obtain practical results for the probability distribution function; i.e.,

$$F(R) = \int_0^{R*} f(R)\, dR . \quad (30)$$

A number of special cases can be obtained from the general Rayleigh distribution [equation (29)], the simplest of which is to let $\sigma_x \equiv \sigma_y = \sigma$ and $\bar{X} = \bar{Y} = 0$ with independent variables X and Y. This gives

$$f(R) = \frac{R}{\sigma^2} e^{-R^2/2\sigma^2} , \quad (31)$$

which is recognized as the classical Rayleigh probability density function. The density function, equation (31), can be integrated in closed form over any range of the variable R. Hence, the probability distribution function, F(R), for equation (31) is

$$F(R) = 1 - \exp \left\{ \frac{-R^2}{2\sigma^2} \right\} . \quad (32)$$

C.3.3. The Derived Distribution of Wind Direction

Considering the wind as a vector quantity and bivariate normally distributed, the wind direction can be derived. This is done by first writing the bivariate normal probability density function in polar coordinates whose variables are

$$g(r,\theta) = r d_1 e^{-\frac{1}{2}(a^2 r^2 - 2br + c^2)} \quad , \tag{33}$$

(see footnote 2)

where

$$a^2 = \frac{1}{(1 - \rho^2)} \left[\frac{\sin^2\theta}{\sigma_x^2} - \frac{2\rho \cos\theta \sin\theta}{\sigma_x \sigma_y} + \frac{\cos^2\theta}{\sigma_y^2} \right] \quad ,$$

$$b = \frac{-1}{(1 - \rho^2)} \left[\frac{\bar{x} \sin\theta}{\sigma_x^2} - \frac{\rho(\bar{x} \cos\theta + \bar{y} \sin\theta)}{\sigma_x \sigma_y} + \frac{\bar{y} \cos\theta}{\sigma_y^2} \right] \quad ,$$

$$c^2 = \frac{1}{(1 - \rho^2)} \left[\frac{\bar{x}^2}{\sigma_x^2} - \frac{2\rho \bar{x}\bar{y}}{\sigma_x \sigma_y} + \frac{\bar{y}^2}{\sigma_y^2} \right] \quad ,$$

$$d_1 = \frac{1}{2\pi\sigma_x \sigma_y \sqrt{1 - \rho^2}} \quad ,$$

$r = \sqrt{x^2 + y^2}$ is the modulus of the vector or speed, and θ is the direction of the vector. After integrating $g(r,\theta)$ over $r = 0$ to ∞, the probability density function of θ is

$$g(\theta) = \frac{d_1}{a^2} e^{-\frac{1}{2}c^2} \left[1 + \sqrt{2\pi} \left(\frac{b}{a}\right) e^{\frac{1}{2}\left(\frac{b}{a}\right)^2} \Phi\left(\frac{b}{a}\right) \right] \quad , \tag{34}$$

2. *This expression, equation (33), in Smith 1976) is given with respect to the mathematical convention for a vector direction.*

where a^2, b, c^2, and d_1 are as previously defined in equation (33) and

$$\Phi\left(\frac{b}{a}\right) = \Phi\ (x) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{x} e^{-\frac{1}{2}t^2}\, dt$$

is taken from tables of normal distribution functions or made available through a computer subroutine.

If desired, equation (34) can be integrated numerically over a chosen range of θ to obtain the probability that the vector direction will lie within the chosen range; i.e.,

$$F(\theta) = \int_{\theta_2}^{\theta_1} g(\theta)\, d\theta \quad . \tag{35}$$

One application may be to obtain the probability that the wind will flow from a given quadrant or sector as, for example, onshore.

C.3.4. The Derived Conditional Distribution of Windspeed Given the Wind Direction (Wind Rose)

Continuing with the considerations in section C.3.3. of this chapter, the conditional probability density function (pdf) for windspeed, r, given a specified value for the wind direction, θ, can be expressed as

$$f(r|\theta) = \frac{a^2\, r\, e^{-\frac{1}{2}(a^2 r^2 - br)}}{1 + \sqrt{2\pi}\left(\frac{b}{a}\right) e^{\frac{1}{2}\left(\frac{b}{a}\right)^2} \Phi\left\{\frac{b}{a}\right\}} \quad , \tag{36}$$

where the coefficients, a and b and the function $\Phi\left\{\frac{b}{a}\right\}$ are as previously defined in equation (33) and in equation (34).

From equation (36) the mode (most frequent value) of the conditional windspeed given a specified value of the wind direction is the positive solution of the quadratic equation,

$$a^2\, r^2 - br - 1 = 0 \quad , \tag{37}$$

which is

$$(\ddot{r}\,|\,\theta) = \frac{1}{2a}\left[\left(\frac{b}{a}\right) + \sqrt{4 + \left(\frac{b}{a}\right)^2}\right] \quad . \tag{38}$$

The locus of the conditional modal values of windspeed when plotted in polar form versus the given wind directions forms an ellipse.

The noncentral moment for equation (36) is expressed as

$$\mu_n' = \int_0^\infty r^n \, f(r\,|\,\theta)\, dr \quad . \tag{39}$$

Now the first noncentral moment is identical to the first central moment or the expected value, E $(r|\theta)$. The integration of equation (39) for the first moment is sufficiently simple to yield practical computations and can be expressed as

$$E(r\,|\,\theta) = \frac{\left(\frac{b}{a}\right) + \left[1 + \left(\frac{b}{a}\right)^2\right]\sqrt{2\pi}\; e^{\frac{1}{2}\left(\frac{b}{a}\right)^2}\; \Phi\left\{\frac{b}{a}\right\}}{a\left[1 + \left(\frac{b}{a}\right)\sqrt{2\pi}\; e^{\frac{1}{2}\left(\frac{b}{a}\right)^2}\; \Phi\left\{\frac{b}{a}\right\}\right]} \quad . \tag{40}$$

Hence, equation (40) gives the conditional mean value of the windspeed given a specified value for the wind direction.

The integration of equation (36) for the limits r = 0 to r = r* gives the probability that the conditional windspeed is $\leq$ r* given a value for the wind direction, θ. This conditional probability distribution (PDF) can be written as

$$Pr\left\{r \leq r^* \mid \theta = \theta_o\right\} = 1 - \left[\frac{e^{-\frac{1}{2}r_s^2} + \sqrt{2\pi}\left(\frac{b}{a}\right)\left\{1 - \Phi\,(r_s)\right\}}{e^{-\frac{1}{2}\left(\frac{b}{a}\right)^2} + \sqrt{2\pi}\left(\frac{b}{a}\right)\Phi\left\{\frac{b}{a}\right\}}\right] , \tag{41}$$

where $r_s = \left[a\, r^* - \left(\frac{b}{a}\right)\right]$.

By definition, equation (41) is an expression for a "wind rose." Empirical wind rose statistics are often tabulated or graphically illustrated giving the frequency that the windspeed is not exceeded for those windspeed values that lie within assigned class intervals of the wind direction. After evaluation of equation (41) for various values of windspeed, r^*, and the given wind directions, θ, interpolations can be performed to obtain various percentile values of the conditional windspeed.

For the special case when b in equation (33) equals zero (i.e., for $\bar{x} \equiv \bar{y} = 0$), the conditional modal values of windspeeds [equation (38)], the conditional mean values of windspeeds [equation (40)], and the fixed conditional percentile values of windspeeds [interpolated from evaluations of equation (41)], when plotted in polar form versus the given wind directions, produce a family of ellipses.

For the special case when $\bar{x} = \bar{y} = 0$, equation (36) reduces to the following simple case:

$$\Pr\left\{ r \leq r^* \mid \theta = \theta_0 \right\} = 1 - e^{-\frac{a^2 r^{*2}}{2}} \quad . \tag{42}$$

There is a special significance of equation (42) when related to the bivariate normal probability distribution. If r^* and θ are measured from the centroid of the probability ellipse, then the probability that $r \leq r^*$ is the same as the given probability ellipse. Further, solving equation (42) for r^*, gives

$$r^* = \frac{1}{a} \sqrt{-2 \ln (1 - P)} \quad . \tag{43}$$

If a probability ellipse P is chosen, equation (42) gives the distance of r along any θ from the centroid of the ellipse to the intercept of the specified probability ellipse. If there is an interest in conditional probability of winds for a given θ relative to the monthly means, equation (43) is applicable. If it is desired to find the magnitude of the wind along any θ relative to the monthly mean to the intercept of a given probability ellipse, equation (43) is applicable.

D. Statistical Parameters With Respect To Any Orthogonal Axes

The five wind statistical parameters presented in table I are given with respect to the standard meteorological coordinate system; i.e., these parameters are for the U and V components. For many aerospace vehicles and range applications, there is a need for wind statistics with respect to orthogonal axes other than west to east and south to north. For example, it may be required to present wind statistics with respect to a flight azimuth of an

aerospace vehicle whose flight azimuth is α degrees from true north measured in a clockwise direction. The following sets of equations are presented to compute the five parameters for the new coordinate axes rotated α degrees clockwise from true north.

a. Rotation of the means through α degrees:

$$\bar{X}_\alpha = \bar{X} \cos (90 - \alpha) + \bar{Y} \sin (90 - \alpha) \tag{44}$$

$$\bar{Y}_\alpha = \bar{Y} \cos (90 - \alpha) - \bar{X} \sin (90 - \alpha) \quad . \tag{45}$$

b. Rotation of the variances through α degrees:

$$\sigma_{x_\alpha}^2 = \sigma_x^2 \cos^2 (90 - \alpha) + \sigma_y^2 \sin^2 (90 - \alpha)$$

$$+ 2\rho\sigma_x\sigma_y \cos (90 - \alpha) \sin (90 - \alpha) \tag{46}$$

$$\sigma_{y_\alpha}^2 = \sigma_y^2 \cos^2 (90 - \alpha) + \sigma_x^2 \sin^2 (90 - \alpha)$$

$$- 2\rho\sigma_x\sigma_y \cos (90 - \alpha) \sin (90 - \alpha) \quad . \tag{47}$$

c. Rotation of the linear correlation coefficient through α degrees:

$$\rho_\alpha = \frac{\text{cov } (X,Y)_\alpha}{\sigma_{x_\alpha} \sigma_{y_\alpha}} \quad , \tag{48}$$

where cov $(X,Y)_\alpha$ is the rotated covariance,

$$\text{cov } (X,Y)_\alpha = \text{cov } (X,Y) \left[\cos^2 (90 - \alpha) - \sin^2 (90 - \alpha)\right]$$

$$+ \cos (90 - \alpha) \sin (90 - \alpha) (\sigma_y^2 - \sigma_x^2)$$

and

$$\mathrm{cov}\ (X,Y) = \rho\sigma_x\sigma_y \quad .$$

By using these rotational equations, the bivariate normal distribution with respect to any desired rotated coordinates can be obtained from sample estimates that have been computed with respect to a specific axis. The marginal distributions after rotation are also normally (univariate) distributed. Using the rotational equations greatly reduces computational efforts for applications requiring statistics with respect to several coordinate axes.

Appendix A presents some illustrative examples for the wind statistics of the specific RRA.

CHAPTER III. STATISTICS OF THERMODYNAMICS QUANTITIES AND MODELS

A. General Considerations

A.1. Objectives

The objective inherent in developing the thermodynamic section of the RRA was to describe the thermodynamic characteristics of the atmosphere using a minimum of data tabulations. A set of parameters was selected which, together, thermodynamically describe the climatological state of the atmosphere. These parameters are the pressure, temperature, density, dewpoint, virtual temperature, and water vapor pressure. Used together, these parameters permit the calculation of a large number of derived quantities. (Symbols used in the calculations in this chapter are summarized in table D.) Some of these quantities, such as the speed of sound, are dealt with in section III.E.

The probability distribution of each of the six thermodynamic RRA parameters is described by its mean value, its standard deviation, and its skewness. Several of these parameters (temperature, pressure, dewpoint and density) have probability distributions that are close to a univariate normal distribution; the others do not. The skewness parameter gives an estimate of the asymmetrical departures of a probability distribution.

Hydrostatically modeled mean values of pressure and density were calculated (table IV), so that users may determine the departure of the actual climatological values of these parameters from hydrostatic conditions. This was done by hydrostatically integrating the pressure from the lowest RRA data level to the termination altitude of the particular RRA.

A.2. Data Quality Control

Data limits derived from the following parameters were used to screen the thermodynamic portion of the RRA data base: temperature, pressure, dewpoint (for the 0- to 30-km portion only), and density (for the 30- to 70-km portion only). These limits were set to plus and minus six standard deviations from the mean values of each of these quantities. These limits were used to screen the thermodynamic portion of the RRA data base, according to the procedures described in section I.C. The data base used to generate the thermodynamic portion of the RRA (tables I, II, and IV) was considered to be free from errors under the following conditions:

a) The skewness values of the pressure and temperature were between -2.5 and 2.5 at all data levels.

b) The skewness values of the density were between -3.5 and 3.5 at data levels between 0 and 30 km.

c) The skewness values of the density were between -3.0 and 3.0 at data levels between 30 and 70 km.

d) The skewness values of the dewpoint were between -2.5 and 2.5 at all data levels with more than 10 data values.

TABLE D. LIST OF SYMBOLS USED IN CHAPTER III

C_s - Speed of sound

C_d - Collision diameter

E - Vapor pressure

g_ϕ - Gravity at latitude ϕ

H - Geopotential height

H_m - Geopotential height at a mandatory radiosonde data level

H_s - Geopotential height at a significant radiosonde data level

K_t - Coefficient of thermal conductivity

L - Mean free path length

M - Mean molecular weight of air at sea level

M3Q - Annual or monthly third moment of quantity Q

n - Refractive modulus

N - Refractive index

NA - Avogadro's constant

N_Q - Number of values of quantity Q

P - Pressure

P_m - Pressure at a mandatory radiosonde data level

P_s - Pressure at a significant radiosonde data level

P_h - Hydrostatically integrated mean monthly or annual pressure

Q - Any tabulated RRA quantity

R* - Universal gas constant

R' - Specific gas constant of dry air

r', r* - Parameters used in converting z to h and vice versa

TABLE D. (concluded)

S	-	Sutherland's constant, used in the calculation of dynamic viscosity
T	-	Temperature
T_d	-	Dew point
T_v	-	Virtual temperature
T_{vm}	-	Virtual temperature at a mandatory radiosonde data level
T_{vs}	-	Virtual temperature at a significant radiosonde data level
V	-	Mean air particle speed
V_c	-	Mean collision frequency
w	-	Parameter used in the hydrostatic interpolation of pressure and density
Z	-	Geometric altitude
λ	-	Wavelength
α_Q	-	Skewness of quantity Q
β	-	Constant used in the equation for viscosity
γ	-	Ratio of specific heat at constant pressure to specific heat at constant volume
η	-	Kinematic coefficient of viscosity
μ	-	Dynamic coefficient of viscosity
ρ	-	Density
ρh	-	Mean monthly or annual density derived from pressure height
σ	-	Standard deviation of the quantity Q

A.3. Limitation of Thermodynamic Statistics

The correlation coefficients between the thermodynamic quantities and the moisture-related quantities were not calculated at discrete altitudes, nor were any of the correlations between altitudes. Therefore, valid statistical dispersion models that require the relationship between two or more of these quantities at the same altitude or between altitudes cannot be derived. Approximations for the correlation coefficients between pressure, virtual temperature, and density at discrete altitudes may be obtained from the coefficients of variation as developed by Buell (1970). The coefficient of variation is the standard deviation divided by the mean. The mean values and the standard deviations are taken from table II. A model for the profile of monthly and annual mean pressure, virtual temperature, and density that is in excellent agreement with the respective statistical mean values is given by table IV. This agreement results because the physical relationships, given by the hydrostatic equation and the equation of state, were used to derive table IV. When only the monthly or annual mean values for pressure, virtual temperature, and density are required, it is recommended that table IV be used.

B. Establishing Data Samples at the Required Altitude Levels

This section describes the computational procedures used to establish data samples of the thermodynamic RRA parameters at the RRA data levels. References are cited only when an equation given is one of many available in the literature or when an equation is stated in an unusual form.

B.1. Conversion of Data Recorded in Geopotential Heights to Geometric Altitude

The upper air rocketsonde observations used to obtain the table values above 30 km were recorded in terms of geometric altitude and can be interpolated directly to the altitude intervals shown in the tables. However, the radiosonde observations used to obtain the tabular values below 30 km were recorded in terms of geopotential heights. The change of coordinates from geopotential heights to geometric altitudes (h to z) is accomplished by calculating a table of geopotential heights that correspond exactly to the geometric altitudes at which the atmospheric parameters are tabulated. The radiosonde observations are then interpolated to these geopotential heights. The relationship used to calculate geometric altitude from geopotential height is

$$H = (r'z)/(r^*z) \quad , \qquad (49)$$

where

$$r' = gr^*/9.80665$$

and

$$r^* = -2g_\phi/(\partial g_\phi/\partial z_o) \quad .$$

g_ϕ is the sea-level gravity at the latitude ϕ corresponding to the proper location. This value is given by (List, 1968)

$$g_\phi = 9.780356\ (1 + 5.2885 \times 10^{-3} \sin^2\phi - 5.9 \times 10^{-6} \sin^2 (2\phi)). \tag{50}$$

$\frac{\partial g_\phi}{\partial z_o}$ is the rate of change of gravity at the sea level. This quantity is given

by the equation

$$\frac{\partial g_\phi}{\partial z_o} = -3.085462 \cdot 10^{-6} + 2.27 \times 10^{-9} \cos (2\phi) - 2 \times 10^{-12} \cos (4\phi). \tag{51}$$

The un ts used for gravity are meters per square second, while the units for

$\frac{\partial g_\phi}{\partial z_o}$ are per square second.

The resulting table of values of H obtained by using even increments of 2 in equation (49) is shown in table IV of the RRA. The values of H above 30 km are not used in the interpolation of original data, but are included for the convenience of the user.

B.2. Calculations on the Original Rawinsonde Data Records

It was necessary to interpolate the information from the original rawinsonde data records to the geometric altitudes specified as the RRA data levels. The parameters for which this interpolation was required were the temperature, dewpoint, and pressure. The other parameters were calculated from the interpolated values at each RRA data level. These "derived" parameters were the water vapor pressure, density, and virtual temperature.

B.2.1. Calculation of the Geopotential Height at Significant Levels

Two somewhat different interpolation procedures were used to obtain data from radiosonde and rocketsonde observations at the levels shown in the tables. The procedure used to interpolate radiosonde observations began with the calculation of virtual temperature at each data level in a sounding. The virtual temperature was computed by

$$T_v = T/(1. - 0.379\ (e/p)) \quad , \tag{52}$$

where T_v and T are in degrees Kelvin and e and p are in millibars.

The radiosonde soundings contain a mix of data taken at "mandatory" and "significant" levels. Pressure, temperature, and dewpoint information was given in these soundings at both types of levels. However, geopotential height information was only given at the mandatory levels. The heights at the significant levels were "filled in" (calculated) hydrostatically using pressure and temperature data from these levels. This procedure permitted the use of most of the significant level data in the calculation of the RRA tables. The equation used for this process was

$$H_s = H_m + 29.2712617 \frac{(T_{vs} - T_{vm})}{2} \ln(P_s/P_m) \ , \tag{53}$$

where the subscripts s and m denote quantities at significant and mandatory levels. This equation was not used if the difference between two adjacent mandatory levels was greater than 200 mb. All soundings with such data gaps were rejected for use in compiling the RRA.

B.2.2. Temperature

Radiosonde temperatures were interpolated logarithmically with respect to pressure using the equation

$$T = T_U + (T_L - T_U) \frac{\ln p - \ln p_L}{\ln p_U - \ln p_L} \ , \tag{54}$$

where the subscripts U and L indicate values at the nearest data levels in the actual sounding above and below the interpolated level.

B.2.3. Pressure

The pressure values in each radiosonde sounding were interpolated to the RRA data levels using the equation

$$p = p_L \exp\left(\frac{H_L - H_U}{29.2712617\ (0.5)\ (T_{v_U} + T_{v_L})}\right) \tag{55}$$

where the subscript L indicates virtual temperature, geopotential height, and pressure values at the data level below and closest to the level at which data were required.

B.2.4. Dewpoint Temperature

Dewpoint values were interpolated logarithmically with respect to pressure using the equation

$$T_d = T_{dU} + (T_{dL} - T_{dU}) \left(\frac{\ln p - \ln p_L}{\ln p_U - \ln p_L}\right) \ . \tag{56}$$

The subscripts U and L indicate data at the nearest upper and lower data levels in a sounding.

B.2.5. Derived Water Vapor Pressure

The water vapor pressure was calculated from the interpolated dewpoint values at the RRA data levels using Teten's approximation:

$$e = 6.11 \text{ mb} \times 10^{7.5(T_d - 273.15)/(T_d - 35.86)} \quad . \tag{57}$$

B.2.6. Derived Density

The density values derived from radiosonde observations were calculated at the RRA data levels using the equation

$$\rho = 348.36787 \, p/T_v \quad . \tag{58}$$

B.2.7. Derived Virtual Temperature

The virtual temperature values were calculated at the RRA data levels for each sounding using the equation

$$T_v = T/(1 - 0.379(e/p)) \quad , \tag{59}$$

where T_v and T are in degrees Kelvin, and p and e are the pressure and vapor pressure, respectively, in millibars.

B.3. Calculations on the Original Rocketsonde Data Records

The rocketsonde data records used to calculate the RRA table values above 30 km were given in terms of geometric altitude. For this reason, slightly different calculations were required to convert the recorded data values to values at the RRA data levels. The pressure, temperature, and density were all interpolated to the RRA data levels; moisture-related parameters (virtual temperature, water vapor pressure, and dewpoint) were not calculated, since atmospheric moisture at altitudes above 30 km was considered to be negligible.

No interpolation was done across gaps in the pressure or temperature data within a sounding larger than 7,000 m. Data values at the RRA levels within such a gap were set to missing.

B.3.1. Temperature

Rocketsonde temperatures were interpolated linearly with respect to geometric altitude using the equation

$$T = T_U + (T_L - T_U) \frac{Z - Z_L}{Z_U - Z_L} , \tag{60}$$

where the subscripts U and L indicate values at the nearest data level in the actual sounding above and below the interpolated level.

B.3.2. Pressure

The pressure values in each rocketsonde sounding were interpolated to the RRA data levels using the equation

$$P = P_L \exp\left(-\frac{g_\phi}{R^*} \frac{M(Z - Z_L)}{\overline{T}v} \cdot W^2\right) , \tag{61}$$

where $\overline{T}_v = \frac{T_{vU} + T_{vL}}{2}$ and $W = \frac{r^*}{\left(r^* + Z + \frac{Z - Z_L}{2}\right)}$.

B.3.3. Density

Rocketsonde density values were interpolated using the equation

$$\rho = \rho_L \exp\left(-\frac{g_\phi M}{R^*} \frac{(Z - Z_L)}{\overline{T}_v} \cdot W^2\right) , \tag{62}$$

where W is specified in section III.B.3.2.

C. Computation of Statistical Parameters for Tables II and III

A three-step procedure was used for computing the monthly and annual means, standard deviations, and skewness values from the data values at the RRA data levels. Initially, certain statistical sums were calculated and stored as the soundings in the data base were processed. These sums were then used to calculate the monthly statistics given in the RRA tables. The annual statistics were then calculated from these stored sums and the monthly statistics.

C.1. Stored Statistical Sums

The sums calculated were

$$\sum Q,\ \sum Q^2,\ \text{and}\ \sum Q^3 \quad ,$$

where Q is any one of the quantities given in the thermodynamic part of the RRA.

C.2. Calculation of the Monthly Statistics

C.2.1. Monthly Means

The mean monthly values of the thermodynamic RRA quantities were calculated using the equation

$$\bar{Q} = \sum Q/N_Q \quad ,$$

where N_Q is the number of observed values of the quantity Q for a given month.

C.2.2. Monthly Standard Deviations

The monthly standard deviations of the thermodynamic RRA quantities were calculated using the equation

$$\sigma_Q = \sqrt{\frac{(N_Q \Sigma' Q^2) - (\Sigma Q)^2}{N_Q \cdot (N_Q - 1)}} \quad . \tag{63}$$

C.2.3. Monthly Skewness Values

The monthly skewness values of the windspeed and of the thermodynamic RRA quantities were calculated using the equation

$$\alpha_Q = \frac{M3_Q}{\sigma_Q^{\ 3}} \quad ,$$

where $M3_Q$ is the third moment of the quantity Q, σ_Q is its standard deviation, and

$$M_{3Q} = \left[\frac{\Sigma_Q^{\ 3}}{N_Q} - \frac{3\Sigma_Q \Sigma_Q^{\ 2}}{N_Q^2} - \frac{2\Sigma_Q^{\ 3}}{N_Q^3}\right] \cdot \frac{N_Q^{\ 2}}{(N_Q - 1)\ (N_Q - 2)} \quad . \tag{64}$$

C.3. Calculation of the Annual Statistics

Equations (63) and (64), used to calculate the monthly values of the standard deviations and skewness values, involve taking the differences between two pairs of large sums containing Q^2 and Q^3, where Q is any thermodynamic RRA quantity. Using these equations to compute the annual statistics would have resulted in a substantial loss of precision, as these sums become larger by several orders of magnitude in such a case. This problem was avoided by calculating the annual means, standard deviations, and skewness values from the monthly statistics.

C.3.1 Annual Mean Values

The annual mean values of the thermodynamic RRA quantities were calculated using the equation

$$Q_{ANN} = Q_A / N_Q \quad ,$$

where Q_A is the total of all observed values of Q and N_Q is the total number of observations of Q.

C.3.2. Annual Standard Deviations

The annual standard deviations of the thermodynamic RRA quantities were calculated using the equation

$$\sigma Q_{ANN} = \sqrt{\frac{1}{N_Q} \sum_{i=1}^{12} (N_{Qi}\, \sigma_{Qi}^{\,2}) + \frac{1}{N_Q} \sum_{i=1}^{12} (N_{Qi}\, \bar{Q}_i^{\,2}) - Q_{ANN}^{\,2}} \quad , \tag{65}$$

where N_{Qi} = the number of data values for Q in month i (i = 1 to 12), $\bar{Q}_i$ = the monthly mean of Q, and σ_{Qi} = the standard deviation of quantity Q in month i.

C.3.3. Annual Skewness Values

The annual skewness values of the thermodynamic RRA quantities were calculated using the equation

$$M3Q_{ANN} = \frac{1}{N} \sum_{i=1}^{12} (N_{Qi}\ M_{3Qi}) + \frac{3}{NQ_{ANN}} \sum_{i=1}^{12} (N_{Qi}\ \bar{Q}_i\ \sigma_{Qi}^{\ 2})$$

$$+ \frac{1}{NQ_{ANN}} \sum_{i=1}^{12} (N_{Qi}\ Q_i^{\ 3}) - \frac{3\bar{Q}_{ANN}}{NQ_{ANN}} \sum_{i=1}^{12} (N_{Qi}\ Q_i^{\ 2})$$

$$- \frac{3\bar{Q}_{ANN}}{NQ_{ANN}} \sum_{i=1}^{12} (N_{Qi}\ \sigma_{Qi}^{\ 2}) + 2\bar{Q}_{ANN}^{\ \ 3} \quad , \qquad (66)$$

where M_{3Qi} = the third moment about the mean of quantity Q in month i and $M3Q_{ANN}$ = the annual third moment about the mean of the quantity Q.

D. Derived Monthly Mean and Annual Mean Model Atmospheres

A set of modeled monthly mean and annual mean hydrostatic values of pressure and density was calculated from the lowest RRA data level (0 km, mean sea level) upwards to 30 km, and from 30 km upwards to 70 km. The integration from 0 to 30 km was computed independently of the integration from 30 to 70 km because of the difference in data sources. The two different values for 30 km are provided for comparison. When 30-km data are required, the values given in the 0- to 30-km table should be used. These hydrostatically modeled mean values, which are given in table IV, are useful as a check on the validity of the pressure and density values given in table II. In most cases, the values in tables II and IV for any given data level are within 1 percent of each other. The hydrostatic pressure values in table IV were calculated using the equation

$$p_1 = p_0 \exp\left(- \frac{0.034162\ (H_1 - H_0)}{0.5\ (T_{v_1} + T_{v_0})} \right) , \qquad (67)$$

where $H_1 - H_0$ is in meters and a "0" subscript refers to values at the RRA data level immediately below the level being checked. p_0 at the lowest data level is set equal to the RRA mean pressure; p_1, calculated for the next highest data level, is taken as p_0 for the level above that. This process is repeated for all the other RRA data levels. The hydrostatic density corresponding to the hydrostatic pressures is calculated from these pressures and the RRA virtual temperature values using the formula

$$\rho_H = 348.36786\ P_H/T_v \quad , \qquad (68)$$

where ρ_H and P_H are the hydrostatic density and pressure shown in table IV of the RRA.

E. Thermodynamic Quantities Derivable from the Basic Tables

Several other quantities can be calculated from the statistics listed in tables I and II. Primary physical constants used in these calculations are listed in table E. The equations given in this section can be used to calculate the approximate mean values of these quantities at each RRA data level. It is not possible to infer or derive any information concerning the standard deviation or skewness values of these quantities from the data in tables II and III of the RRA.

E.1. Mean Air Particle Speed

The mean air particle speed, V, is the arithmetic average of the speeds of all air particles in the volume element being considered. For a valid average to occur, there must be a sufficient number of particles involved to represent mean conditions. The equation for V for dry air is

$$V = \sqrt{\frac{8}{\pi} \cdot \frac{R^*T}{M}} \quad . \tag{69}$$

A computational form for dry air, using tabulated values, is

$$V = \sqrt{7.3094 \times 10^2 \times T} \text{ (meters per second)} \quad , \tag{70}$$

where T is the temperature in degrees Kelvin from table II. Equation (69), when corrected for moist air, becomes

$$V = \sqrt{\frac{8}{\pi} \cdot R' \, T_V} \quad . \tag{71}$$

The computational form for moist air is

$$V = \sqrt{7.3094 \cdot 10^2 \cdot T_V} \text{ (meters per second)} \quad , \tag{72}$$

where T_V is the virtual temperature in degrees Kelvin from table III.

TABLE E. LIST OF PRIMARY PHYSICAL CONSTANTS

P_o = standard atmospheric pressure at sea level
$= 1.013250 \times 10^5$ Newton/m^2 = 2116.22 lb/ft^2

ρ_o = standard atmospheric density at sea level
$= 1.2250$ kg/m^3 = 0.076474 lb/ft^3

T_o = standard temperature at sea level = 288.15 K = 15.0°C = 59.0°F

g_o = standard gravity at sea level at latitude 45°32'33"
$= 9.80665$ m/s^2

S = Sutherland's constant used in calculation of dynamic viscosity
= 110.4 K

T_I = ice-point temperature at P_o = 273.15 K

β = constant used in calculation of dynamic viscosity
$= 1.458 \times 10^{-6}$ kg/s m K$^{\frac{1}{2}}$
$= 7.3025 \times 10^{-7}$ lb/s ft R$^{\frac{1}{2}}$

γ = ratio of specific heat of air at constant pressure to specific heat of air at constant volume
= 1.4

C_D = mean effective collision diameter of air molecules
$= 3.65 \times 10^{-10}$ m $= 1.1975 \times 10^{-9}$ ft

N_a = Avogadro's constant
$= 6.022169 \times 10^{26}$/kg mol $= 2.73179 \times 10^{26}$/lb mol

R* = gas constant = 8.31432 J/mol K

R' = gas constant for dry air = 2.8704×10^2 J/kg K

M = molecular weight of dry air = 28.966 g/mol

E.2. Mean Free Path

The mean free path, L, is the mean value of the distance traveled by each neutral air particle in a selected air parcel, between successive collisions with other particles in that parcel. A meaningful average requires that the selected parcel be large enough to contain a substantial number of particles. The equation for L is given by

$$L = \left(\frac{\sqrt{2}}{2\pi}\right)\left(\frac{R^*T}{N_a\ C_d^{\ 2}\ P}\right) \quad , \tag{73}$$

where C_d is the effective collision diameter of the mean air molecules. The 1976 standard atmosphere value of 3.65×10^{-10} is valid for the range of altitudes in the RRA.

A computational form for moist air, using tabulated values, is

$$L = 2.335 \times 10^{-7}\ \frac{T}{P}\ \text{(meters)} \quad , \tag{74}$$

where T is the temperature in degrees Kelvin from table II and P is the pressure in millibars from table II.

A form of (73) to correct L for moist air is

$$L = \left(\frac{\sqrt{2}}{2\pi}\right)\frac{R'MT_v}{N_a\ C_d^{\ 2}} \quad . \tag{75}$$

The computational form for moist air is

$$L = 2.3325 \times 10^{-7}\ \frac{T_v}{P}\ \text{(meters)} \quad , \tag{76}$$

where T_v is the virtual temperature in degrees Kelvin from table III and P is the pressure in millibars from table II.

E.3. Mean Collision Frequency

The mean collision frequency, V_c, is considered to be the average speed of air particles contained in an air parcel, divided by the mean free path of the particles inside that parcel. Computationally this is equivalent to

$$V_c = \frac{V}{L} \text{ (sec}^{-1}\text{)} \quad . \tag{77}$$

To determine V_c for dry air, use V and L from equations (70) and (74). To determine V_c for moist air, use V and L from equations (72) and (76).

E.4. Speed of Sound

The expression for the speed of sound, C_s, in meters per second in dry air, is

$$C_s = \sqrt{\frac{\gamma R^* T}{M}} \quad . \tag{78}$$

To compute C_s for dry air from tabulated values, use

$$C_s = \sqrt{4.0185 \cdot 10^2 \cdot T} \quad \text{(meters per second)} \quad , \tag{79}$$

where T is the temperature in degrees Kelvin from table II. One form for the speed of sound in moist air is

$$C_s = \sqrt{\gamma R' T_v} \quad , \tag{80}$$

where T_v is the virtual temperature from table III. A computational form for moist air is

$$C_s = \sqrt{4.0185 \times 10^2 \, T_v} \quad \text{(meters per second)} \quad . \tag{81}$$

E.5. Dynamic Coefficient of Viscosity

The coefficient of dynamic viscosity, μ, is defined as a coefficient of internal friction developed where gas regions move adjacent to each other at different velocities. The following expression is taken from the U.S. Standard Atmosphere (1976):

$$\mu = \frac{\beta \cdot T^{3/2}}{T + S} \quad . \tag{82}$$

The computational form is

$$\mu = \frac{(1.458 \cdot 10^{-6})\, T^{3/2}}{T + 110.4} \quad \text{(kilograms per second per meter)} \, , \tag{83}$$

where T is the temperature in degrees Kelvin from table II.

E.6. Kinematic Coefficient of Viscosity

The kinematic coefficient of viscosity, designated as η, is defined to be the ratio of the dynamic coefficient of viscosity of a gas to its density, or

$$\eta = \mu/\rho \quad . \tag{84}$$

The computational form is

$$\eta = 1.0 \times 10^{3}\, \mu/\rho \quad \text{(square meters per second)} \, , \tag{85}$$

where μ is the dynamic coefficient of viscosity from equation (83) and ρ is the density in grams per cubic meter from table II.

E.7. Coefficient of Thermal Conductivity

The empirical expression used for the coefficient of thermal conductivity, designated as K_t, is given in the 1976 Standard Atmosphere as

$$K_t = \frac{2.65019 \times 10^{-3} \cdot T^{3/2}}{T + 245.4 \times 10^{-(12/T)}} \quad \text{(watts per meter per degree Kelvin)} \, , \tag{86}$$

where T is in degrees Kelvin.

E.8. Refractive Modulus and Refractive Index

The refractive modulus or refractivity (Selby and McClatchey, 1975; Smith and Weintraub, 1953) is defined as N, where

$$N = (n - 1) \cdot 10^{6} \tag{87}$$

and n is the refractive index.

For microwave frequencies below approximately 30 GHz (equivalent to wavelengths above 1 cm), N, the refractive modulus, is given by the empirical equation

$$N = 77.6 \frac{P}{T_d} + 3.73 \times 10^5 \frac{e}{T^2} \text{ (dimensionless)}, \qquad (88)$$

where E and P are in millibars and T and T_d are in degrees Kelvin.

The following expression is valid for the visible and infrared wavelengths shorter than approximately 30 μm (0.03 mm).

$$N = 77.6 \frac{P}{T} + 0.584 \frac{P}{T\lambda} \text{ (dimensionless)}, \qquad (89)$$

where λ is the wavelength in microns and T is in degrees Kelvin.

The expression for N for the wavelength from 0.03 mm to 1 cm is an extremely complex function of wavelength.

CHAPTER IV. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

This document satisfies the technical objectives established for the RRAC by the RCC MG. Upper air statistics and models for wind and thermodynamic quantities for the specific site have been derived in a consistent and uniform manner, which will be used in publications for all other assigned site locations. These RRAs represent an improvement over the previously published RRAs because of the availability of more extensive upper air data bases and the adaptation of more advanced statistical techniques. A statistical measure of central tendency (mean values) and a measure of dispersion (standard deviation with respect to the mean values) for monthly and annual reference periods have been tabulated for all variables in a consistent manner from data bases that have been edited and quality-controlled in the same manner. Further, a statistical measure for symmetry (skewness coefficient that involves the third statistical moment) has been tabulated for all variables except the U and V wind components. Even with these improvements, the user of these RRAs must recognize certain limitations of the statistical tabulations:

1) The wind profile structure with respect to altitude cannot be modeled from the RRA statistics because the interlevel and crosslevel correlations were not computed.

2) The profile structure with respect to altitude for any of the thermodynamic variables or any quantities derivable from these variables cannot be modeled because the prerequisite correlations were not computed. However, the profiles of monthly and annual means for pressure, virtual temperature, and density are in agreement (table IV) with the hydrostatic equation and the equation of state.

The preceding limitations are cited to prevent a misuse of the RRAs. More extensive statistical tabulations were beyond the scope of this committee's task. As greater insight is gained through usage of these RRAs, many adaptations of the statistical tabulations for specific engineering and scientific applications are envisioned.

Recommendations

It is recommended than the wind and thermodynamic statistical tabulations and attendant models contained in the RRAs be used as a standard reference source, as may be appropriate, by the ranges and range users. It is further recommended that the respective Range Staff Meteorologist or responsible agency staff member be consulted for the applicability of the RRAs for specific engineering applications.

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CONVERSION UNITS

Physical Constants and Conversion Factors

Numerical values in this document are given in the International System of Units (SI, Système International d'Unités). The values in parentheses are equivalent U.S. Customary Units, which are English units adapted for use by the United States of America. The SI and U.S. Customary Units provided in table F are those normally used for measuring and reporting atmospheric data.

By definition, the following fundamental conversion factors are exact:

Type	U.S. Customary Units	Metric
Length	1 U.S. yard (yd)	0.9144 meter (m)
Mass	1 avoirdupois pound (lb)	453.59237 gram (g)
Time	1 second (s)	1 second (s)
Temperature	1 degree Rankine (°R)	9/5 degree Kelvin (K)

To aid in the conversion of units, conversion factors based on the above fundamental conversion factors are given in table F.

TABLE F. FACTORS FOR CONVERSION UNITS

Type of Data	Metric Unit	Metric Abbreviation	U.S. Customary Unit	U.S. Customary Abbreviation	Conversion: Multiply	By	To Get
TEMPERATURE							
Ambient Temperature	degree Celsius	°C	degree Fahrenheit	°F	°F - 32	0.5556	°C
	degree Kelvin	K	degree Rankine	°R	°C	1.8*	°F - 32
					°R	1.00*	°F + 459.67
					°R - 459.67	1.00*	°F
					K	1.00*	°C + 273.15
					K - 273.15	1.00*	°C
Temperature Change	degree Celsius	°C	degree Fahrenheit	°F	°C or K	1.8*	temp. change °F or °R
	degree Kelvin	K	degree Rankine	°R	°F or °R	0.5556	temp. change °C or K
DENSITY							
Water Vapor Vapor Concentration (Absolute Humidity) and Ambient Density	gram per cubic meter	$g\ m^{-3}$	grain per cubic foot	$gr\ ft^{-3}$	$g\ m^{-3}$	0.43700	$gr\ ft^{-3}$
	gram per cubic centimeter	$g\ cm^{-3}$			$gr\ ft^{-3}$	2.2883	$g\ m^{-3}$
					$g\ m^{-3}$	10^{-6}*	$g\ cm^{-3}$
					$g\ cm^{-3}$	4.370×10^{5}	$gr\ ft^{-3}$
					$gr\ ft^{-3}$	2.288×10^{-6}	$g\ cm^{-3}$
WIND							
Windspeed	meter per second	$m\ s^{-1}$	mile per hour	mph	$m\ s^{-1}$	2.2369	mph
			knots	knots	mph	0.44704*	$m\ s^{-1}$
			feet per second	$ft\ s^{-1}$	$m\ s^{-1}$	1.9438	knots
					knots	0.51444	$m\ s^{-1}$
					mph	0.868976	knots
					knots	1.15078	mph
					$m\ s^{-1}$	3.2808	$ft\ s^{-1}$
					$ft\ s^{-1}$	0.3048*	$m\ s^{-1}$
DISTANCE							
Length	meter	m	feet	ft	m	3.2808	ft
	micron	μ	inch	in.	ft	0.3048*	m
	Angstrom unit	Å			in.	$2.54 \times 10^{+4}$*	μ
					in.	$2.54 \times 10^{+8}$*	Å
					m	10^{+6}*	μ
					m	10^{+10}*	Å

* Defined exact conversion factor

TABLE F. (continued)

Type of Data	METRIC Unit	METRIC Abbreviation	U.S. CUSTOMARY Unit	U.S. CUSTOMARY Abbreviation	CONVERSION Multiply	CONVERSION By	CONVERSION To Get
DISTANCE (Concluded)					μ	10^{-6}*	m
					μ	3.937×10^{-5}	in.
					Å	10^{-10}*	m
					Å	3.937×10^{-9}	in.
MASS							
Weight	gram	g	grain	gr	lb	0.45359237*	kg
	kilogram	kg	pound	lb	lb	453.59237*	g
					kg	2.20462	lb
					g	15.4324	gr
					gr	0.06480	g
PRESSURE							
Atmospheric	newton per square meter	newton m^{-2}	pound force per square inch	lb $in.^{-2}$	mb	10^{-3}*	bar
					bar	10^{3}*	mb
	millimeter of Mercury	mmHg	inch of Mercury	in. Hg	newton m^{-2}	10^{-2}*	mb
					newton m^{-2}	1.4504×10^{-4}	lb $in.^{-2}$
					lb $in.^{-2}$	6.8948×10^{3}	newton m^{-2}
	bar	bar			mb	1.4504×10^{-2}	lb $in.^{-2}$
	millibar	mb			lb $in.^{-2}$	68.948	mb
	dyne per square centimeter (microbar)	dyne cm^{-2}			mb	10^{3}*	dyne cm^{-2}
					dyne cm^{-2}	10^{-3}*	mb
	kilogram force per square meter	kg m^{-2}			lb $in.^{-2}$	6.8948×10^{4}	dyne cm^{-2}
					dyne cm^{-2}	1.4504×10^{-5}	lb $in.^{-2}$
					mb	10.1972	kg m^{-2}
					kg m^{-2}	0.0980665	mb
					lb $in.^{-2}$	703.0696	kg m^{-2}
					kg m^{-2}	0.0014223	lb $in.^{-2}$
					mb	2.9530×10^{-2}	in. Hg (32°F)
					mb	0.75006	mmHg (0°C)
					in. Hg (32°F)	25.40*	mmHg (0°C)
					mmHg (0°C)	1.33322	mb
					in. Hg (32°F)	33.8639	mb
	pascal	Pa			Pa	1.00*	newton m^{-2}

* Defined exact conversion factor

TABLE I-1. WIND STATISTICAL PARAMETERS

JANUARY

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	MEAN U M/S	S.D. U M/S	R(U,V)	MEAN V M/S	S.D. V M/S	MEAN WS M/S	S.D. WS M/S	SKEW WS	NOBS
.020	-6.30	1.80	.0045	3.97	1.03	7.57	1.64	.15	508.
1.000	-3.59	2.09	-.3459	1.55	2.09	4.69	2.50	.40	509.
2.000	-3.17	3.72	[illegible]	.12	2.08	4.93	2.60	.93	509.
3.000	-4.31	3.91	-.1956	-.09	2.33	5.85	2.93	.43	509.
4.000	-4.63	3.39	-.1453	-.65	2.89	6.07	2.97	.49	510.
5.000	-5.14	3.65	-.1209	-.70	3.05	6.34	3.05	.31	503.
6.000	-5.80	3.97	-.0833	-.54	3.31	7.10	3.21	.16	509.
7.000	-5.62	4.75	-.0441	-.35	3.59	7.54	3.31	.11	509.
8.000	-4.06	6.52	.0205	-1.11	3.80	7.78	3.75	.71	509.
9.000	-1.81	9.03	.0173	-1.57	4.31	8.23	4.69	1.30	510.
10.000	.49	9.93	.0156	-2.28	4.90	8.86	5.75	1.28	509.
11.000	2.54	9.99	.0596	-2.94	5.42	9.95	6.71	1.27	507.
12.000	5.08	10.01	.0535	-3.70	5.33	11.05	7.65	1.14	507.
13.000	7.80	12.07	.0270	-3.72	5.65	13.11	8.95	1.07	507.
14.000	9.09	13.39	.0445	-2.52	5.78	14.29	9.84	.33	507.
15.000	6.49	12.17	.1705	-1.51	5.53	12.40	8.31	1.00	505.
16.000	1.18	8.33	.0072	-1.41	4.43	9.74	5.12	.99	506.
17.000	-3.57	5.77	-.1304	-1.21	3.70	6.97	3.55	.47	509.
18.000	-6.15	4.34	-.3073	-.44	3.31	7.54	4.05	.55	499.
19.000	-3.33	5.84	[illegible]	-.32	2.69	7.04	4.00	.74	494.
20.000	-7.68	8.19	-.1074	.02	2.49	9.30	6.97	.60	490.
21.000	-10.45	10.77	-.1477	.75	2.71	11.80	9.56	.59	483.
22.000	-13.81	12.03	-.1050	1.61	3.22	15.07	11.01	.47	481.
23.000	-15.09	10.95	-.0040	1.30	2.70	16.30	10.48	.35	473.
24.000	-17.23	10.75	.0701	.62	3.22	17.05	10.23	.37	459.
25.000	-17.74	10.09	.0451	-.09	3.13	18.25	9.70	.41	455.
26.000	-18.35	10.53	-.0074	-1.69	2.90	18.87	10.11	.44	441.
27.000	-19.57	12.16	-.0313	-1.75	3.03	20.31	11.42	.31	414.
28.000	-21.27	13.10	-.0515	-1.30	3.21	21.97	12.38	.20	402.
29.000	-23.52	13.89	.0192	-1.06	3.11	24.13	13.21	-.04	326.
30.000	-25.08	13.84	.1181	-.84	3.27	25.62	13.76	-.16	303.
32.000	-22.15	13.14	.0808	-.37	3.86	22.77	12.64	.01	81.
34.000	-26.55	12.93	-.2146	.09	3.96	26.95	12.74	-.02	81.
36.000	-30.24	11.10	-.1430	1.50	4.49	30.63	11.03	.12	81.
38.000	-34.55	10.44	.0349	1.07	4.59	34.83	10.43	.20	81.
40.000	-42.88	9.83	.0401	.68	4.93	43.15	9.90	.58	81.
42.000	-52.25	8.56	.0455	-1.18	5.83	52.60	6.48	.01	81.
44.000	-61.49	9.05	-.0411	-3.23	7.60	62.05	8.95	-.18	81.
46.000	-67.94	13.29	-.0465	-5.30	8.15	68.63	13.31	-.18	80.
48.000	-71.46	17.99	-.2910	-6.27	7.28	72.14	17.62	-.32	79.
50.000	-63.61	22.97	-.0070	-6.68	9.11	64.73	22.01	-.33	77.
52.000	-45.86	24.16	.0218	-7.25	10.12	49.23	22.55	.12	76.
54.000	-26.23	20.95	-.0705	-4.33	14.06	33.92	17.32	.77	74.
56.000	-14.85	17.15	.1339	-1.13	15.17	24.41	12.04	.73	70.
58.000	-1.54	16.54	-.1309	1.43	15.57	20.14	10.40	.38	58.
60.000	4.24	17.46	-.2739	3.09	14.29	20.46	10.49	1.00	50.
62.000	6.44	17.37	-.0199	2.29	17.37	22.49	11.56	1.22	43.
64.000	11.77	16.85	-.0045	4.73	18.56	25.41	11.16	.28	27.
66.000	20.23	19.51	-.0590	5.01	22.72	29.43	19.84	.47	7.

TABLE I-2 WIND STATISTICAL PARAMETERS

FEBRUARY

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	MEAN U M/S	S.D. U M/S	R(U,V)	MEAN V M/S	S.D. V M/S	MEAN WS M/S	S.D. WS M/S	SKEW WS	NOBS
.000	-6.37	1.92	.0559	3.78	1.75	7.62	1.81	-.13	461.
1.000	-4.33	2.59	-.3409	2.55	2.16	5.49	2.54	.23	461.
2.000	-2.73	3.31	-.2459	.26	2.81	4.61	2.26	.60	459.
3.000	-3.55	3.51	-.2228	-.92	2.67	5.26	2.52	.30	459.
4.000	-3.48	3.57	-.1671	-1.15	3.03	5.43	2.42	.33	459.
5.000	-4.29	3.58	-.1251	-.60	2.86	5.70	2.69	.27	459.
6.000	-5.42	3.82	-.1763	-.38	3.20	6.77	2.93	.37	459.
7.000	-5.93	4.52	-.1223	-.69	3.53	7.63	3.10	.22	459.
8.000	-5.27	5.47	-.1003	-1.32	3.70	7.88	3.32	.36	459.
9.000	-4.05	5.49	-.2190	-1.89	4.20	8.01	3.94	.59	459.
10.000	-2.47	7.31	-.1410	-2.52	4.87	8.39	4.37	.92	459.
11.000	-.68	8.67	-.0272	-3.36	5.61	9.55	5.18	1.19	456.
12.000	1.39	9.50	-.0129	-3.42	5.53	9.94	5.95	1.08	454.
13.000	3.00	10.57	-.0112	-3.29	5.78	10.71	7.08	1.33	455.
14.000	2.90	11.18	-.0534	-2.01	5.88	11.01	7.39	1.31	456.
15.000	.31	10.03	-.1376	-2.30	5.13	9.75	6.10	1.39	455.
16.000	-2.50	7.30	-.1931	-1.75	4.13	7.76	4.40	.87	457.
17.000	-4.79	5.23	-.1021	-.74	3.53	7.11	3.52	.57	450.
18.000	-6.17	5.11	-.0297	.02	3.31	7.52	4.13	.61	446.
19.000	-6.84	5.65	-.0257	-.17	2.61	8.05	4.04	.67	444.
20.000	-8.57	8.09	-.1676	.09	2.78	9.62	7.08	.64	439.
21.000	-10.73	10.62	-.1504	.81	3.07	12.10	9.59	.61	425.
22.000	-13.55	11.06	.0152	1.49	3.21	14.63	10.00	.55	420.
23.000	-15.29	10.16	.2205	1.33	2.77	15.79	8.86	.53	411.
24.000	-16.84	9.92	.1032	1.08	3.47	17.42	9.59	.52	401.
25.000	-17.80	10.18	-.0351	-.44	3.18	18.29	9.83	.77	393.
26.000	-19.04	11.29	-.0357	-1.23	2.94	19.49	10.93	.59	375.
27.000	-20.22	12.71	-.0079	-1.84	3.07	20.90	12.09	.23	350.
28.000	-22.02	13.74	-.0068	-1.89	3.01	22.70	13.08	.13	332.
29.000	-23.66	14.44	-.0312	-1.79	3.33	24.54	13.76	-.02	259.
30.000	-25.72	14.37	-.0348	-1.72	3.06	26.20	13.92	-.09	241.
32.000	-22.08	13.70	.2329	-1.20	3.76	22.67	13.29	.16	73.
34.000	-26.69	13.29	-.0989	-.63	3.93	27.03	13.20	.14	73.
36.000	-31.33	12.49	-.2311	-.33	3.93	31.64	12.30	.37	73.
38.000	-35.25	11.57	-.0309	-.16	4.86	35.50	11.48	.49	73.
40.000	-40.42	10.19	-.1205	.78	4.86	40.74	10.10	.73	73.
42.000	-45.43	14.21	.1920	.79	6.00	46.03	13.52	.32	73.
44.000	-45.89	19.69	.2407	-1.66	8.01	47.04	18.60	-.21	73.
46.000	-40.10	23.53	.2119	-2.93	8.87	41.82	22.33	.05	76.
48.000	-30.13	24.84	.1205	-4.99	6.89	33.45	21.83	.81	77.
50.000	-17.64	22.44	.1020	-6.78	8.21	24.44	18.10	1.34	77.
52.000	-4.87	17.92	-.0742	-7.22	8.79	19.45	11.37	1.46	77.
54.000	3.71	15.22	.0031	-6.07	10.01	18.17	8.94	.55	72.
56.000	8.93	15.67	.0235	-3.64	10.44	19.35	10.43	1.04	62.
58.000	11.89	11.72	.3424	-1.13	10.19	17.90	7.78	.22	53.
60.000	15.81	12.35	.1616	-1.30	11.99	21.63	8.71	-.07	51.
62.000	15.64	16.38	-.3920	1.09	12.55	23.25	11.09	.67	36.
64.000	15.91	16.44	-.4237	.22	13.99	24.24	10.73	.61	21.
66.000	12.53	20.57	.7527	-2.39	14.23	23.13	14.15	.42	8.

TABLE I-3. WIND STATISTICAL PARAMETERS

MARCH

STATION = 619020   ASCENSION (WIDE AWAKE)

Z KM	MEAN U M/S	S.D. U M/S	R(U,V)	MEAN V M/S	S.D. V M/S	MEAN WS M/S	S.D. WS M/S	SKEW WS	NOBS
.020	-6.47	1.98	-.0870	3.75	1.78	7.74	1.76	-.14	506.
1.000	-4.76	2.55	-.3311	2.69	2.13	5.84	2.62	.23	507.
2.000	-2.66	3.79	-.3078	.44	2.57	4.63	2.50	.69	506.
3.000	-2.61	3.85	-.1945	-.79	2.77	4.87	2.50	.58	505.
4.000	-3.05	3.43	-.0725	-.35	2.66	4.30	2.43	.53	505.
5.000	-4.17	3.25	[illegible]	-.64	2.07	5.61	2.49	.30	506.
6.000	-5.20	3.81	[illegible]	-.31	3.10	6.43	2.03	.25	507.
7.000	-5.55	3.87	-.2370	-.41	3.31	6.87	3.10	.33	507.
8.000	-4.58	4.68	-.1631	-.68	3.81	6.82	3.36	.31	506.
9.000	-2.97	5.61	-.0955	-.90	4.41	6.93	3.54	.78	505.
10.000	-1.02	6.54	-.0407	-1.33	4.91	7.33	3.97	.92	505.
11.000	.80	7.53	.0209	-1.99	5.59	8.36	4.74	1.16	505.
12.000	2.22	8.13	.0302	-3.01	5.50	9.07	5.29	1.14	505.
13.000	3.35	9.35	.0674	-3.55	5.70	10.36	6.03	.97	506.
14.000	4.26	10.55	.0303	-3.10	5.51	11.24	6.56	.96	506.
15.000	3.09	9.90	-.0031	-1.95	5.04	9.99	6.06	.96	505.
16.000	-.29	7.25	-.0573	-1.32	4.18	7.37	4.17	1.15	500.
17.000	-3.72	4.79	-.0021	-.66	3.32	6.12	3.27	.72	492.
18.000	-5.51	5.59	.0930	.17	3.01	7.34	4.09	.52	491.
19.000	-5.65	6.64	-.0155	.38	2.69	7.70	5.18	.82	490.
20.000	-7.17	8.54	-.0030	.81	2.66	9.26	6.91	.62	483.
21.000	-9.45	9.83	-.0445	1.20	2.79	11.03	8.57	.59	474.
22.000	-12.00	10.51	.0265	1.63	3.02	13.31	9.46	.67	471.
23.000	-13.54	9.27	.1379	1.73	2.55	14.25	8.69	.58	467.
24.000	-14.67	9.54	.0367	1.51	3.25	15.47	8.94	.64	457.
25.000	-16.13	10.43	-.0225	.09	3.09	16.69	9.99	.85	454.
26.000	-17.42	11.81	-.0576	-1.01	2.83	18.01	11.30	.50	436.
27.000	-18.93	13.13	-.0336	-1.78	2.79	19.77	12.34	.20	389.
28.000	-20.68	13.83	-.0375	-2.37	2.90	21.69	12.76	.01	377.
29.000	-22.87	14.46	.0316	-2.39	2.83	23.00	13.39	-.14	280.
30.000	-24.03	14.16	-.0730	-2.10	2.69	24.77	13.26	-.29	[illegible]
32.000	-19.57	15.65	.0056	-.76	3.27	21.14	13.84	-.03	99.
34.000	-23.02	14.32	-.0152	1.04	3.82	23.60	13.91	-.02	99.
36.000	-27.68	13.01	-.1595	1.34	4.28	28.15	12.76	-.11	99.
38.000	-29.76	11.34	.0665	.07	4.58	30.20	11.07	-.13	99.
40.000	-27.05	12.83	.0867	-.83	5.07	27.79	12.25	.22	99.
42.000	-19.41	19.31	.3700	.85	6.45	23.31	15.72	.49	98.
44.000	-8.25	20.83	.3008	1.06	7.81	19.60	13.30	.89	101.
46.000	-.10	17.78	.2375	-.20	7.01	16.21	10.00	.89	101.
48.000	4.37	16.20	.0835	-1.96	7.06	16.17	9.27	.80	100.
50.000	11.87	13.92	.0347	-4.11	7.16	18.25	8.08	.19	100.
52.000	17.12	12.85	.2441	-3.80	8.66	21.23	9.62	-.06	99.
54.000	21.08	11.48	.0792	-3.61	8.53	23.59	10.21	-.32	96.
56.000	23.79	11.56	.0417	-3.06	8.42	25.78	10.69	.02	91.
58.000	24.29	13.64	.1266	-.33	9.26	26.41	12.78	.30	79.
60.000	25.73	16.95	.1673	.03	10.92	29.47	14.05	.51	66.
62.000	23.89	20.27	.0510	.77	14.30	30.04	15.10	.44	50.
64.000	23.90	19.58	-.3154	-.02	10.19	28.19	15.93	.59	27.
65.000	30.99	24.18	.2276	-.82	15.87	37.11	19.18	.28	9.

TABLE I-4. WIND STATISTICAL PARAMETERS

APRIL

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	MEAN U M/S	S.D. U M/S	R(U,V)	MEAN V M/S	S.D. V M/S	MEAN WS M/S	S.D. WS M/S	SKEW WS	NOBS
.020	-6.84	1.93	.1010	3.80	1.72	8.04	1.77	-.36	485.
1.000	-5.37	2.07	-.3048	2.93	2.19	6.40	2.91	.01	481.
2.000	-3.04	4.32	-.1472	.29	2.43	5.12	2.82	.74	484.
3.000	-2.30	4.15	-.2105	-.71	2.57	4.75	2.65	.58	484.
4.000	-2.26	3.63	-.1870	-.05	2.57	4.42	2.44	.60	485.
5.000	-2.89	3.34	-.1702	-.51	2.69	4.73	2.48	.53	485.
6.000	-3.47	3.63	-.1512	-.20	3.05	5.37	2.75	.70	486.
7.000	-3.53	4.42	-.0038	.10	3.34	5.79	3.11	.73	485.
8.000	-2.70	5.26	-.1147	.49	3.78	6.12	3.46	1.02	487.
9.000	-.65	5.94	-.1485	.33	4.27	6.33	3.78	.93	485.
10.000	1.14	6.57	-.0617	-.54	5.09	7.15	4.41	1.23	483.
11.000	2.51	7.21	.0348	-2.49	6.02	8.72	4.95	1.29	482.
12.000	3.56	7.76	.0315	-3.30	6.09	9.57	5.40	1.31	481.
13.000	4.40	8.72	.0171	-3.46	6.04	10.36	6.03	1.06	480.
14.000	4.73	9.48	-.0361	-2.62	5.40	10.38	6.43	1.13	480.
15.000	3.59	9.23	.0203	-1.95	4.54	9.36	5.90	1.39	473.
16.000	.35	7.57	.0933	-1.33	3.77	7.17	4.67	1.40	473.
17.000	-3.09	6.15	-.0077	-.61	3.32	6.61	3.90	1.05	471.
18.000	-4.03	6.31	-.0459	.06	3.25	6.82	4.47	1.56	472.
19.000	-3.44	7.16	-.0562	.43	2.62	6.83	4.84	1.20	469.
20.000	-4.72	8.53	-.0947	.74	2.53	7.96	6.21	1.05	463.
21.000	-6.66	9.25	-.0701	.97	2.80	9.35	7.16	.69	457.
22.000	-8.20	9.26	-.0190	1.02	3.04	10.34	7.51	1.04	451.
23.000	-10.01	6.90	.0321	1.05	2.33	11.19	7.76	.91	433.
24.000	-11.96	10.58	.0182	.87	2.85	13.38	9.07	.72	435.
25.000	-14.07	11.96	.0164	.71	3.00	15.54	10.44	.43	431.
26.000	-15.79	13.09	-.0039	.06	2.75	17.31	11.33	.25	413.
27.000	-16.84	14.24	-.0122	-.81	2.89	18.65	11.83	.07	367.
28.000	-17.83	14.66	.0121	-1.74	2.99	20.26	11.64	-.03	355.
29.000	-18.04	15.75	.0534	-2.30	3.26	21.03	12.11	-.04	262.
30.000	-17.98	15.95	-.0423	-2.24	2.78	21.01	12.03	-.10	261.
32.000	-10.79	17.53	.1097	-.49	3.42	17.40	11.44	.21	90.
34.000	-11.64	16.71	.1740	1.49	3.08	17.23	11.55	.42	91.
36.000	-12.42	14.66	.0794	1.00	3.68	15.90	11.93	57	91.
38.000	-8.44	14.13	.1905	1.17	4.14	14.59	9.64	1.01	92.
40.000	-.45	14.85	.1576	1.22	6.02	13.86	8.02	.41	92.
42.000	9.39	14.17	.2151	3.47	5.01	16.12	8.04	.30	92.
44.000	18.01	10.55	.1022	2.91	5.34	20.00	8.48	.00	93.
46.000	21.93	9.25	-.1303	1.25	5.08	22.72	8.79	.05	93.
48.000	24.16	10.21	-.0153	-1.12	5.23	25.10	9.20	.10	93.
50.000	25.80	11.31	.0748	-2.37	5.60	27.05	9.93	-.23	93.
52.000	28.63	11.73	-.0003	-2.51	6.07	29.75	10.72	-.34	90.
54.000	32.62	12.01	.0806	-1.43	6.63	33.59	11.21	-.76	80.
56.000	35.45	11.16	.0425	.19	8.36	37.54	10.60	-.25	83.
58.000	40.57	11.87	-.3047	1.38	9.08	41.73	11.36	-.31	73.
60.000	40.09	13.32	-.3075	3.61	8.85	41.51	12.31	-.19	59.
62.000	43.40	17.64	-.2293	4.33	11.35	45.85	15.51	-.52	46.
64.000	35.77	19.75	-.1522	8.57	11.54	41.36	15.15	.21	26.
66.000	29.88	25.34	-.0638	3.31	11.75	35.62	17.95	.72	13.

TABLE I-5. WIND STATISTICAL PARAMETERS

MAY

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	MEAN U M/S	S.D. U M/S	R(U,V)	MEAN V M/S	S.D. V M/S	MEAN WS M/S	S.D. WS M/S	SKEW WS	NOBS
.020	-7.28	1.90	.0403	3.67	1.69	6.36	1.75	-.33	509.
1.000	-5.42	2.61	-.3183	2.52	2.10	6.33	2.82	.03	509.
2.000	-1.96	3.87	[illegible]	.05	2.54	4.43	2.38	.77	510.
3.000	-.56	3.81	-.1053	-.87	2.83	4.29	2.28	.65	510.
4.000	-.86	3.72	-.1246	-.59	2.91	4.18	2.43	1.15	510.
5.000	-1.69	4.04	-.2392	-.24	2.94	4.56	2.65	1.00	510.
6.000	-2.43	4.93	-.2005	-.16	3.23	5.50	3.19	.74	510.
7.000	-2.43	5.52	-.1536	.14	3.60	6.05	3.57	.79	509.
8.000	-1.04	6.11	-.1437	.40	4.46	6.64	3.78	.93	504.
9.000	1.20	6.71	-.1290	-.09	5.08	7.36	4.27	1.00	503.
10.000	3.08	6.91	-.1031	-1.80	5.47	6.16	4.67	1.01	504.
11.000	4.42	7.27	-.0246	-4.02	6.03	9.64	5.65	.79	504.
12.000	5.50	7.88	.0813	-4.80	5.58	10.54	5.34	.72	505.
13.000	6.43	8.30	.1328	-5.03	5.60	11.67	6.26	.61	504.
14.000	7.53	9.40	.1093	-4.55	5.46	12.34	6.68	.60	503.
15.000	7.52	9.12	.0815	-3.75	5.05	11.74	6.43	.58	504.
16.000	4.10	7.35	.0347	-2.37	4.19	8.45	4.75	.70	503.
17.000	-.03	[illegible]	-.0347	-.91	3.65	6.09	3.43	.84	496.
18.000	-1.45	[illegible]	-.0700	.01	3.28	6.44	3.73	.60	490.
19.000	.23	6.70	[illegible]	.39	2.70	6.41	3.55	.54	491.
20.000	-.25	7.51	-.0244	.70	2.73	8.75	4.32	.92	485.
21.000	-2.60	8.32	.0976	.50	2.87	7.37	5.49	1.20	477.
22.000	-5.60	9.31	.0373	.23	2.81	9.36	6.18	.93	475.
23.000	-8.17	10.79	-.0323	.03	2.36	11.44	7.60	.55	466.
24.000	-10.41	12.93	[illegible]	-.14	2.82	14.31	8.97	.17	463.
25.000	-12.00	14.62	[illegible]	-.12	3.02	16.93	9.25	-.03	456.
26.000	-13.12	13.64	[illegible]	-.18	2.95	18.52	9.00	-.14	441.
27.000	-13.68	16.47	.0217	-.52	3.22	19.55	9.28	-.16	399.
28.000	-13.57	17.18	-.0044	-1.23	2.97	20.04	9.35	-.16	391.
29.000	-14.46	17.72	-.0105	-1.53	3.28	21.12	9.45	-.35	319.
30.000	-13.65	18.09	-.0539	-1.10	2.95	20.78	9.55	-.28	304.
32.000	-3.43	18.93	-.0751	40	3.42	17.64	3.28	-.13	73.
34.000	-3.68	15.99	.2736	1.62	4.43	15.01	7.94	.27	73.
36.000	-1.62	13.41	-.0572	2.04	4.20	12.53	6.71	.61	73.
38.000	4.51	13.45	-.1225	2.44	4.20	13.00	7.33	.32	73.
40.000	11.16	12.64	-.1403	3.15	4.03	15.81	7.69	.28	73.
42.000	16.30	10.75	-.1785	2.67	4.29	17.95	9.17	.33	73.
44.000	17.84	9.84	-.2551	2.38	5.19	19.28	8.67	.32	76.
46.000	17.74	11.20	-.1604	2.07	5.97	19.59	9.77	.21	75.
48.000	15.78	12.97	-.0931	-.57	7.35	19.20	10.07	.14	75.
50.000	16.49	13.00	-.1429	-2.22	7.01	20.14	9.37	.15	74.
52.000	18.89	14.30	-.0557	-2.56	7.46	22.62	10.47	.26	74.
54.000	21.63	15.83	.0339	-1.01	6.30	24.69	12.14	-.08	71.
56.000	25.25	17.80	-.0977	2.28	6.44	28.43	13.79	.04	69.
58.000	26.57	20.63	-.0342	5.57	7.85	31.59	14.90	.04	59.
60.000	26.30	26.55	.3207	5.40	8.95	34.59	17.34	-.20	37.
62.000	32.53	31.14	.3262	5.81	9.98	42.36	18.25	-.81	22.
64.000	28.57	36.70	.6788	5.77	18.74	46.23	17.40	.19	13.
66.000	20.91	35.06	.6696	4.99	15.06	35.25	21.95	-.03	8.

TABLE I-6. WIND STATISTIC AL PARAMETERS

JUNE

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	MEAN U M/S	S.D. U M/S	R(U,V)	MEAN V M/S	S.D. V M/S	MEAN WS M/S	S.D. WS M/S	SKEW WS	NOBS
.020	-7.21	1.96	.1400	3.51	1.90	8.28	1.78	.02	474.
1.000	-5.39	2.60	-.3114	2.85	2.19	6.45	2.06	.12	474.
2.000	-1.08	3.58	-.0947	.47	2.70	4.24	2.38	.73	475.
3.000	-.14	3.65	-.1641	-.70	3.25	4.39	2.29	.53	475.
4.000	-.52	4.14	-.1926	-.86	3.03	4.59	2.48	.62	475.
5.000	-1.89	4.78	-.1370	-.26	2.97	5.18	2.89	.82	475.
6.000	-2.93	5.91	-.0497	.19	3.52	6.48	3.73	.88	476.
7.000	-2.89	6.68	-.0337	.66	4.43	7.51	4.07	.83	475.
8.000	-1.50	6.95	-.1719	.48	5.02	7.61	4.22	.82	474.
9.000	.22	7.13	-.1525	-1.00	5.58	8.00	4.75	.78	474.
10.000	1.35	7.25	-.0493	-2.59	6.01	8.87	4.55	.58	472.
11.000	1.99	8.07	.1218	-5.24	6.51	10.61	5.12	.46	471.
12.000	3.57	9.17	.2504	-5.06	6.59	11.85	5.64	.57	471.
13.000	5.23	9.81	.1967	-5.21	6.22	12.38	5.93	.55	470.
14.000	6.57	9.10	.0093	-3.86	5.72	11.70	6.05	.47	470.
15.000	5.67	7.86	-.0537	-2.35	5.41	9.87	5.58	.61	465.
16.000	2.10	6.45	.0177	-1.31	4.34	7.07	4.05	.89	463.
17.000	-.63	5.76	.0392	-.65	3.41	5.68	3.33	.78	455.
18.000	-.32	6.17	-.0175	-.32	3.28	6.05	3.50	.93	454.
19.000	1.45	6.38	-.1331	-.15	2.95	6.24	3.54	.60	451.
20.000	1.18	7.24	-.1512	-.08	2.80	6.83	3.86	.67	449.
21.000	-.80	9.10	-.0053	.05	2.78	8.09	5.05	.78	432.
22.000	-4.34	11.79	.0400	.22	2.84	11.24	6.27	.42	430.
23.000	-7.30	13.32	-.0205	.10	2.56	13.43	7.54	.12	425.
24.000	-9.76	14.94	-.0643	-.33	3.14	16.12	8.26	-.07	422.
25.000	-10.07	15.55	-.1650	-.68	2.94	17.50	7.83	-.13	415.
26.000	-11.50	16.15	-.1675	-.62	2.84	18.36	8.03	-.16	394.
27.000	-11.77	16.99	-.1231	-.97	3.26	18.96	8.85	-.22	353.
28.000	-11.48	17.55	-.0604	-.94	2.78	19.05	9.22	-.24	345.
29.000	-12.23	17.87	-.0049	-.89	3.05	19.72	9.46	-.29	289.
30.000	-11.08	17.01	.0219	-.45	2.72	18.21	9.35	-.10	262.
32.000	-3.93	15.56	-.0433	.35	3.64	13.08	9.86	.96	61.
34.000	-1.80	14.43	-.1333	-.32	3.57	12.67	7.82	.56	61.
36.000	.85	17.02	.4073	.06	4.31	15.03	7.73	.44	61.
38.000	4.84	16.36	.3326	1.61	3.97	15.52	8.05	.33	61.
40.000	6.90	13.81	.0463	1.77	4.63	14.39	7.29	.38	61.
42.000	7.45	13.28	-.1927	2.60	5.06	14.41	7.36	.61	61.
44.000	5.32	14.62	-.1304	3.53	5.30	14.84	7.73	.64	61.
46.000	1.73	15.45	.0069	3.28	6.08	14.94	8.12	.34	61.
48.000	-1.31	17.53	.1402	.37	7.41	16.25	9.79	.58	61.
50.000	-1.48	20.34	.1390	-3.08	6.35	17.92	11.80	.68	60.
52.000	1.40	23.97	.3374	-2.79	7.72	21.51	13.17	.78	59.
54.000	7.52	23.27	.0221	-.59	8.37	22.64	12.17	.65	53.
56.000	12.29	21.09	.1325	1.47	9.41	23.17	13.47	.66	54.
58.000	18.31	19.57	-.1025	2.33	7.76	24.17	13.94	.43	47.
60.000	24.26	20.77	-.2193	3.60	10.20	30.30	14.51	-.05	33.
62.000	26.53	23.31	.0760	2.09	12.13	32.87	17.46	.21	23.
64.000	30.64	18.00	-.0463	1.66	13.69	35.57	12.76	-.03	14.
66.000	33.47	18.72	-.2482	-2.04	9.99	35.67	16.51	-.02	6.

TABLE I-7. WIND STATISTICAL PARAMETERS

JULY

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	MEAN U M/S	S.D. U M/S	R(U,V)	MEAN V M/S	S.D. V M/S	MEAN WS M/S	S.D. WS M/S	SKEW WS	NOBS
.020	-7.38	1.81	-.0589	3.47	1.88	8.43	1.73	-.09	463.
1.000	-5.02	2.69	-.1870	3.18	2.32	7.06	2.60	.10	467.
2.000	-1.79	3.55	-.0253	.46	3.08	4.53	2.55	.74	467.
3.000	.30	4.36	-.0074	-1.21	3.48	5.09	2.63	.46	467.
4.000	-.54	4.40	-.1027	-.00	3.00	4.72	2.04	.81	467.
5.000	-2.39	4.62	-.1076	-.37	3.14	5.25	3.06	.95	467.
6.000	-3.50	5.40	-.1233	-.18	3.64	6.37	3.76	1.01	463.
7.000	-3.18	6.04	-.0550	.18	4.02	6.83	3.83	.75	467.
8.000	-1.83	6.67	-.1312	.32	4.56	7.32	3.90	.79	463.
9.000	-.36	7.40	-.0771	-.88	5.66	8.31	4.31	.78	465.
10.000	.88	8.24	.0509	-2.72	6.45	9.71	4.82	.48	465.
11.000	2.27	9.91	.2035	-3.89	7.21	11.66	5.86	.41	462.
12.000	4.46	11.30	.2176	-4.05	6.71	12.82	6.65	.49	453.
13.000	7.04	11.28	.1933	-3.32	6.59	13.91	7.32	.61	459.
14.000	8.71	11.09	.0440	-1.71	5.96	13.30	7.76	.52	456.
15.000	6.15	8.62	-.0350	-.80	4.84	9.99	6.02	.79	455.
16.000	1.43	6.44	-.1025	-.83	3.85	6.67	3.82	.98	454.
17.000	-.86	5.37	-.0953	-.33	3.30	5.46	3.27	.83	445.
18.000	.42	5.51	-.0171	.52	3.34	5.54	3.35	.97	446.
19.000	1.65	5.68	.0023	.66	2.84	5.69	3.32	.85	445.
20.000	.92	7.60	.0325	.68	2.67	7.05	4.02	1.12	434.
21.000	-1.84	11.11	.0749	.46	3.14	10.34	5.44	.71	426.
22.000	-5.56	13.68	.1187	-.11	2.95	13.42	6.81	.25	423.
23.000	-7.61	14.13	.0230	-.24	2.74	14.37	7.64	.09	412.
24.000	-9.17	14.75	-.0721	-.22	3.35	15.73	8.08	.04	409.
25.000	-10.57	14.80	-.1702	-.12	3.04	16.39	9.44	.11	395.
26.000	-11.53	14.90	-.1713	-.28	2.82	16.75	9.05	-.01	381.
27.000	-12.02	15.27	-.1129	-.64	3.23	17.11	9.77	-.04	356.
28.000	-12.35	15.09	-.0025	-.60	2.83	16.79	10.31	.06	346.
29.000	-13.47	15.18	.0755	-.28	3.21	17.81	10.21	-.03	278.
30.000	-12.38	13.53	.1309	.14	2.82	15.22	9.67	.09	200.
32.000	-5.50	12.27	.1561	.65	3.56	10.77	8.81	1.10	87.
34.000	-5.38	10.72	.1160	.35	3.29	10.43	6.72	.92	87.
36.000	-7.63	12.91	.0409	.04	4.01	13.38	7.79	.59	87.
38.000	-9.69	15.42	.1294	.93	4.16	15.52	10.37	.80	87.
40.000	-11.05	15.61	.0270	2.11	5.25	16.86	10.56	.67	87.
42.000	-13.45	15.23	.0152	3.32	5.96	18.36	11.00	.32	87.
44.000	-16.78	15.94	-.0554	4.05	6.56	20.64	12.05	.26	89.
46.000	-21.20	16.90	-.0469	4.60	6.73	24.53	14.08	.27	89.
48.000	-24.18	16.76	.0393	1.28	7.91	27.08	13.93	.30	88.
50.000	-23.37	17.29	.2092	-1.79	8.19	26.57	14.41	.53	87.
52.000	-17.39	15.98	.1089	-3.35	7.71	21.30	13.15	.73	85.
54.000	-7.96	15.50	.0499	-2.37	8.61	17.52	8.57	.90	84.
56.000	.98	14.91	-.1023	-2.67	9.44	16.17	7.39	.31	80.
58.000	9.61	14.04	-.2011	-2.72	11.48	18.32	9.47	.56	69.
60.000	13.88	16.39	.1206	1.88	10.72	21.00	11.52	.51	44.
62.000	18.26	17.22	.4054	7.51	9.70	24.03	14.05	.28	35.
64.000	22.28	17.71	-.3052	5.63	9.69	27.43	13.16	.53	23.
66.000	22.19	23.68	.0392	10.48	12.69	33.00	13.65	-.12	11.

TABLE I-8. WIND STATISTICAL PARAMETERS

AUGUST

STATION = 815020   ASCENSION (WIDE AWAKE)

Z KM	MEAN U M/S	S.D. U M/S	R(U,V)	MEAN V M/S	S.D. V M/S	MEAN WS M/S	S.D. WS M/S	SKEW WS	NOBS
.020	-7.34	1.77	.0039	3.45	1.59	8.29	1.67	-.15	483.
1.000	-6.59	2.51	-.2012	3.60	2.14	7.80	2.51	-.30	481.
2.000	-3.77	4.16	-.18[illegible]	.79	2.60	5.52	2.63	.56	480.
3.000	-1.94	4.54	-.0337	-1.00	3.16	5.31	2.59	.54	479.
4.000	-1.04	4.14	-.1[illegible]	-.87	3.28	5.24	2.01	.83	479.
5.000	-2.70	4.50	-.12[illegible]	-.18	3.22	5.47	2.69	.63	479.
6.000	-3.28	5.13	-.0[illegible]	.09	3.71	6.32	3.27	.59	480.
7.000	-2.34	5.79	-.0700	.51	4.09	6.63	3.46	.69	480.
8.000	-.03	6.48	-.[illegible]13	.56	4.78	7.19	3.78	.63	479.
9.000	.15	7.39	-.[illegible]	-.77	5.67	8.24	4.41	.76	478.
10.000	.95	8.39	.1315	-2.72	6.60	9.73	5.24	.64	477.
11.000	2.18	10.19	.3114	-4.30	8.07	12.27	6.43	.46	476.
12.000	5.25	10.67	.3[illegible]3	-3.53	8.05	12.95	7.12	.60	476.
13.000	8.41	10.41	.2[illegible]	-2.14	7.23	13.45	7.39	.43	475.
14.000	9.62	8.62	.0[illegible]	-.77	6.23	12.62	6.91	.37	475.
15.000	6.51	5.03	-.0[illegible]	-.83	5.31	9.54	5.21	.53	474.
16.000	2.00	5.53	-.2[illegible]3	-1.04	4.02	6.28	3.52	.73	473.
17.000	-.45	4.79	-.2[illegible]	-.30	3.06	5.06	2.63	.70	470.
18.000	.36	5.28	-.0[illegible]1	.35	3.10	5.30	3.10	1.03	469.
19.000	1.60	6.59	-.0540	.51	2.77	6.20	3.92	1.20	469.
20.000	.40	8.79	-.0446	.61	2.67	8.03	4.50	.98	467.
21.000	-2.51	11.90	-.0134	.54	2.98	11.26	5.49	.23	459.
22.000	-5.53	13.98	.0574	.25	2.84	13.55	7.03	.20	455.
23.000	-7.59	14.72	.1033	.23	2.69	14.02	8.21	.25	448.
24.000	-9.41	14.56	.0837	.20	3.30	15.03	8.92	.15	443.
25.000	-11.16	14.99	-.0346	.05	2.95	16.38	9.29	.05	433.
26.000	-11.95	15.29	-.0924	-.56	2.94	17.06	9.71	.03	419.
27.000	-11.82	16.13	-.0503	-1.02	3.08	17.38	10.38	.13	381.
28.000	-12.13	16.19	-.0055	-.66	2.61	17.22	10.93	.09	374.
29.000	-13.17	15.68	-.0037	-.46	3.06	17.74	10.65	-.03	304.
30.000	-12.43	14.04	-.0591	-.03	2.73	16.11	9.95	.09	205.
32.000	-5.40	12.05	.1006	.41	3.60	11.43	8.23	.00	89.
34.000	-7.18	11.41	-.0149	.06	3.91	12.01	7.18	.71	89.
36.000	-9.10	13.52	-.0159	-.70	4.55	14.52	8.54	.61	89.
38.000	-12.77	16.04	-.0390	.72	5.54	17.57	11.80	.47	89.
40.000	-16.14	15.92	.0008	2.73	6.00	19.82	12.77	.41	88.
42.000	-15.90	13.12	.0172	4.28	6.18	19.23	10.41	.36	88.
44.000	-16.05	11.75	-.0603	4.21	8.08	19.33	10.09	.33	88.
46.000	-15.98	11.65	-.1944	2.21	7.07	18.97	10.09	.34	88.
48.000	-12.14	12.18	-.0073	-.15	6.93	16.07	9.19	.58	89.
50.000	-6.04	12.36	.0543	-2.03	7.10	13.03	8.47	.73	87.
52.000	-1.25	13.83	-.0053	-2.44	7.60	13.47	8.63	.93	86.
54.000	2.37	13.11	-.0790	-2.20	7.94	13.30	8.15	.63	84.
56.000	8.15	13.73	-.1595	-1.17	8.32	15.71	8.74	.56	79.
58.000	14.05	13.60	-.1306	2.92	8.77	19.57	9.06	.45	68.
60.000	18.01	14.42	.0331	6.42	12.44	24.30	11.55	.22	53.
62.000	22.68	16.56	-.0057	11.07	15.91	30.91	14.10	.07	33.
64.000	27.30	17.53	-.1571	9.10	16.74	35.00	13.60	-.17	20.
66.000	23.49	18.57	-.3741	22.13	11.88	36.70	12.11	.03	10.

TABLE I-9. WIND STATISTICAL PARAMETERS

SEPTEMBER

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	MEAN U M/S	S.D. U M/S	R(U,V)	MEAN V M/S	S.D. V M/S	MEAN WS M/S	S.D. WS M/S	SKEW WS	NOBS
.020	-6.95	1.85	.1123	3.54	1.60	8.01	1.69	-.40	445.
1.000	-6.85	2.55	-.2533	3.51	2.15	8.01	2.47	-.25	444.
2.000	-6.51	4.28	-.1773	1.09	2.92	7.59	3.58	.41	444.
3.000	-5.89	5.04	-.2247	-.79	2.81	7.46	3.59	.45	443.
4.000	-4.24	4.93	-.0723	-1.14	2.86	6.23	3.60	.66	443.
5.000	-3.27	4.46	-.2616	-.43	2.94	5.36	3.27	.99	443.
6.000	-3.43	5.16	-.2097	.13	3.18	5.92	3.67	1.15	443.
7.000	-3.03	5.97	-.0365	.33	3.73	6.57	3.94	.91	443.
8.000	-1.47	6.55	-.0333	-.21	4.31	7.04	3.75	.64	443.
9.000	.14	7.42	-.0039	-1.60	5.30	8.25	4.19	.60	443.
10.000	1.85	8.60	.1373	-3.09	6.39	10.17	4.92	.80	442.
11.000	4.08	9.65	.2015	-4.01	6.96	12.01	5.82	.49	441.
12.000	7.81	10.46	.1551	-3.05	6.50	13.17	6.94	.56	441.
13.000	10.55	10.43	.0404	-2.06	6.11	14.45	7.83	.31	441.
14.000	12.11	9.30	-.0597	-1.15	5.59	14.43	7.57	.16	442.
15.000	9.30	7.33	-.0305	-1.09	4.93	11.35	6.10	.41	442.
16.000	3.47	5.35	-.1222	-1.40	3.85	6.67	3.59	.63	440.
17.000	-.38	4.74	-.1765	-.04	2.91	4.96	2.57	.65	435.
18.000	-.22	5.52	-.0953	.23	3.10	5.44	3.24	1.22	434.
19.000	.28	6.87	-.0432	.31	2.89	6.16	3.03	1.05	431.
20.000	-.86	9.09	-.1063	.45	2.86	8.52	4.37	.09	426.
21.000	-2.65	12.10	-.0749	.32	2.97	11.40	5.76	.35	418.
22.000	-5.44	14.36	-.0039	.53	2.96	13.68	7.61	.43	416.
23.000	-7.36	15.14	-.0003	.65	2.83	14.58	8.91	.30	400.
24.000	-9.57	15.77	-.0293	.54	3.71	16.06	8.81	.35	396.
25.000	-11.10	14.84	-.0045	.00	3.22	15.97	9.92	.16	389.
26.000	-12.00	14.40	-.1945	-.52	2.82	15.68	10.34	.15	361.
27.000	-12.61	14.80	-.2130	-.86	3.37	16.49	10.87	.18	332.
28.000	-12.91	14.51	-.2222	-.93	2.69	15.65	11.57	.25	320.
29.000	-14.20	14.30	-.1871	-.80	3.14	17.10	11.13	.15	243.
30.000	-13.87	13.54	.0030	-.65	2.63	16.25	10.90	.22	220.
32.000	-6.46	12.51	.0757	-.61	3.53	12.43	7.42	.52	86.
34.000	-6.00	14.33	-.0226	.45	3.30	13.99	7.42	.33	88.
36.000	-6.97	15.66	.0356	.29	3.95	14.99	9.11	.47	88.
38.000	-8.78	16.64	-.1077	.63	4.13	15.58	11.27	.49	68.
40.000	-10.90	17.12	-.0094	1.23	5.75	17.17	12.23	.65	83.
42.000	-10.28	16.39	.0479	1.12	5.15	16.78	10.90	1.17	89.
44.000	-7.09	14.82	-.0387	2.83	5.02	14.44	9.63	1.48	91.
46.000	-1.57	14.88	.1470	3.06	6.28	14.11	8.45	.96	92.
48.000	3.21	13.61	-.0243	.51	6.53	13.52	7.69	.84	91.
50.000	6.45	13.67	-.1207	-3.31	7.29	14.65	8.73	.95	91.
52.000	8.00	15.75	.0450	-5.40	6.65	17.39	8.99	.52	90.
54.000	9.71	15.68	.1193	-5.12	6.24	17.75	9.38	.50	89.
56.000	12.97	13.27	.0190	-1.81	8.07	17.78	9.59	.48	88.
58.000	16.18	14.18	.0479	3.26	8.02	20.29	11.16	.59	80.
60.000	20.26	15.00	-.1762	7.14	8.44	24.55	12.14	.91	66.
62.000	25.69	17.52	.0154	7.84	10.00	30.00	14.98	.42	49.
64.000	34.12	19.46	.3753	8.64	11.65	38.58	15.98	.33	26.
66.000	48.06	16.73	.0584	6.32	11.69	43.60	16.48	-.25	10.

TABLE I-10. WIND STATISTICAL PARAMETERS

OCTOBER

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	MEAN U M/S	S.D. U M/S	R(U,V)	MEAN V M/S	S.D. V M/S	MEAN WS M/S	S.D. WS M/S	SKEW WS	NOBS
.020	-7.15	1.61	.0975	3.20	1.60	8.00	1.55	-.10	461.
1.000	-6.97	2.37	-.3032	2.78	2.18	7.79	2.47	-.14	461.
2.000	-7.30	4.40	-.0783	.63	2.79	8.16	3.76	.39	460.
3.000	-7.14	4.91	-.2005	-.41	2.61	8.21	3.63	.20	460.
4.000	-5.67	4.96	.0486	-1.10	2.55	7.05	3.84	.48	459.
5.000	-4.18	4.28	-.0748	-.83	2.84	5.87	3.18	.82	460.
6.000	-3.61	4.82	-.2983	-.61	3.35	6.09	3.27	1.03	461.
7.000	-2.56	5.18	-.2724	-.19	4.03	6.22	3.32	.91	461.
8.000	-.37	5.95	-.2059	.09	4.97	6.71	3.88	1.26	458.
9.000	2.60	6.84	-.2418	-.32	6.08	8.24	4.75	.97	453.
10.000	5.47	7.48	-.1627	-1.29	7.12	10.36	5.56	.53	450.
11.000	8.21	8.35	-.0316	-2.55	8.19	13.04	6.37	.37	460.
12.000	11.21	8.82	-.0933	-2.94	7.66	14.93	6.91	.17	462.
13.000	13.56	8.68	-.1336	-2.63	7.31	16.35	7.47	.18	463.
14.000	14.28	8.57	-.2546	-1.93	6.46	16.24	7.66	.21	462.
15.000	11.54	7.81	-.1943	-1.49	5.28	13.37	6.74	.43	461.
16.000	5.47	6.04	-.0056	-1.33	4.08	7.96	4.63	.85	460.
17.000	.32	4.99	-.1114	-.85	3.10	5.21	2.91	.67	459.
18.000	-.82	5.59	.0973	.33	3.02	5.40	3.45	1.39	447.
19.000	-.80	6.31	.1227	.39	2.67	5.83	3.71	1.30	447.
20.000	-1.90	8.78	.0025	.35	2.70	8.30	4.38	.40	443.
21.000	-4.40	12.28	-.1073	.22	2.76	11.49	6.75	.48	438.
22.000	-6.65	14.48	-.1024	.23	3.15	13.05	8.46	.30	427.
23.000	-8.67	14.85	-.0630	.49	2.71	14.32	9.89	.33	412.
24.000	-11.13	15.27	-.0025	.63	3.43	15.91	10.76	.28	406.
25.000	-13.12	14.33	.0204	.71	2.87	16.48	10.70	.10	393.
26.000	-14.09	13.72	.1250	.22	2.51	16.49	11.00	.10	375.
27.000	-14.78	13.63	.0242	-.58	3.18	17.01	11.20	.03	344.
28.000	-14.01	12.94	-.1023	-1.66	2.67	16.00	10.85	.24	335.
29.000	-13.92	13.21	-.2039	-2.01	3.13	16.59	10.34	.27	262.
30.000	-12.68	13.34	-.1739	-2.03	2.81	15.72	10.17	.37	246.
32.000	-7.59	14.50	.0334	-1.00	3.86	14.40	8.63	.27	83.
34.000	-9.22	15.71	-.0959	-.03	3.44	16.07	9.13	.14	83.
36.000	-8.74	17.79	-.0252	.80	3.69	17.36	10.15	.30	83.
38.000	-7.62	17.41	-.0276	.20	4.12	16.34	10.43	.56	83.
40.000	-3.25	14.35	.1446	.26	4.63	12.89	9.41	1.03	83.
42.000	.45	11.29	.0144	1.62	5.14	10.00	6.28	.63	84.
44.000	4.25	11.50	-.2857	2.13	6.32	12.01	7.04	.75	87.
46.000	8.35	10.56	-.4203	-.97	7.18	12.99	8.01	1.08	85.
48.000	11.38	10.91	-.5467	-2.31	6.45	14.62	8.99	.85	85.
50.000	12.57	11.70	-.1209	-3.29	6.40	15.39	8.78	.39	85.
52.000	14.13	13.29	.2135	-2.03	7.12	18.92	8.42	.41	83.
54.000	17.89	11.54	.1052	-2.73	7.27	20.98	8.50	.10	81.
56.000	19.76	8.28	.1206	-1.52	6.54	21.29	8.23	.29	73.
58.000	20.07	9.23	-.0059	-1.78	7.31	21.33	8.13	.00	60.
60.000	23.05	11.90	.1331	.62	7.81	25.13	10.02	-.03	46.
62.000	24.69	11.31	.0262	3.79	8.53	26.66	10.56	.00	38.
64.000	26.68	9.70	.0375	3.77	7.61	28.19	9.54	-.11	27.
66.000	23.33	16.57	-.0891	6.67	13.28	29.44	12.44	.18	16.

TABLE I-11. WIND STATISTICAL PARAMETERS

NOVEMBER

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	MEAN U M/S	S.D. U M/S	R(U,V)	MEAN V M/S	S.D. V M/S	MEAN WS M/S	S.D. WS M/S	SKEW WS	NOBS
.020	-6.92	1.63	.0316	3.26	1.50	7.81	1.55	-.18	463.
1.000	-5.90	2.34	-.3269	2.05	2.39	6.69	2.36	-.18	462.
2.000	-6.15	3.67	-.2579	-.19	2.74	7.02	3.09	.62	462.
3.000	-5.89	4.20	-.2109	-.87	2.85	7.14	3.22	.31	462.
4.000	-4.77	4.15	-.0709	-.80	2.87	6.22	3.18	.44	461.
5.000	-4.07	3.98	[illegible]	-.61	3.44	6.00	2.02	.45	461.
6.000	-3.54	4.51	-.2053	-.64	3.69	6.11	3.09	.59	459.
7.000	-2.31	5.42	-.1002	-.65	4.04	6.33	3.37	.64	459.
8.000	-.02	6.25	-.2225	-.32	4.93	7.00	3.79	.82	458.
9.000	3.03	7.33	-.1621	-.57	5.93	8.59	4.93	.72	457.
10.000	6.24	8.30	-.1448	-1.75	6.68	11.04	6.01	.59	456.
11.000	9.25	9.28	-.1383	-3.59	7.97	14.07	7.07	.34	452.
12.000	11.94	9.47	-.1906	-4.55	8.07	15.99	7.83	.31	450.
13.000	13.97	9.60	-.2172	-4.72	7.63	17.23	8.41	.23	450.
14.000	14.55	9.47	-.2355	-4.07	6.75	17.09	8.45	.32	449.
15.000	12.13	8.83	-.2200	-2.75	5.54	14.36	7.55	.57	448.
16.000	6.17	7.35	-.0532	-2.20	4.91	9.65	5.27	1.01	446.
17.000	.43	5.94	-.0059	-1.63	3.94	6.41	3.53	.81	439.
18.000	-2.27	5.40	-.0941	-.69	3.09	5.83	3.22	.62	436.
19.000	-1.96	6.19	.0110	-.16	2.71	6.08	3.53	.58	432.
20.000	-3.42	9.14	-.0163	.26	2.69	8.65	5.24	.73	425.
21.000	-6.45	11.82	-.0655	.57	3.08	11.44	7.75	.48	415.
22.000	-9.47	13.08	-.0043	.90	2.91	13.34	9.58	.39	413.
23.000	-12.04	13.20	.0137	.83	2.57	14.52	10.75	.32	407.
24.000	-14.05	13.96	-.0403	.68	3.28	16.71	11.15	.24	403.
25.000	-15.12	13.27	.0378	.31	3.07	17.13	10.90	.27	395.
26.000	-15.03	12.87	.0736	-.37	2.53	16.76	10.90	.15	378.
27.000	-14.35	13.51	.0013	-1.21	2.76	16.96	10.47	.11	336.
28.000	-13.22	14.03	-.0141	-2.01	2.84	16.89	9.90	.27	308.
29.000	-12.27	14.69	-.0044	-1.90	3.37	16.92	9.63	.30	250.
30.000	-11.43	14.93	.0153	-1.56	3.01	16.33	9.34	.40	243.
32.000	-9.44	16.02	.1402	.45	3.90	17.34	8.12	.15	77.
34.000	-8.98	17.99	.1661	-.07	3.87	17.67	10.22	.23	78.
36.000	-7.06	18.24	-.0343	-.03	3.30	16.68	10.59	.35	78.
38.000	-3.59	14.90	.1566	.71	4.35	13.65	8.10	.83	78.
40.000	.85	12.34	.3062	48	4.49	10.73	7.66	1.83	78.
42.000	1.14	12.45	.0627	78	4.67	11.20	7.19	1.09	79.
44.000	-.09	12.97	-.0895	-.45	5.91	12.04	7.53	.85	81.
46.000	-2.30	13.93	-.0689	-1.47	4.83	12.80	7.67	1.00	82.
48.000	-4.35	16.92	-.0597	-3.75	6.16	16.45	9.01	.70	83.
50.000	-6.36	17.62	.1335	-4.32	7.11	17.58	10.52	.52	83.
52.000	-7.22	18.50	.1163	-5.53	6.63	18.45	11.21	.72	82.
54.000	-7.21	19.29	.0966	-6.61	6.70	18.95	12.25	.93	77.
56.000	-6.39	19.92	.1618	-6.56	6.00	18.76	12.58	1.43	74.
58.000	-4.18	19.62	.0858	-6.39	8.06	18.54	12.95	1.38	61.
60.000	-3.09	21.08	-.3371	-5.23	8.31	19.03	13.38	2.14	35.
62.000	1.53	25.73	.1046	-4.29	11.54	23.14	16.17	1.43	28.
64.000	9.08	16.07	-.0429	-4.28	11.87	20.21	8.63	.19	19.
66.000	11.68	13.69	.0923	3.32	13.75	20.33	9.23	.10	12.

TABLE I-12. WIND STATISTICAL PARAMETERS

DECEMBER

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	MEAN U M/S	S.D. U M/S	R(U,V)	MEAN V M/S	S.D. V M/S	MEAN WS M/S	S.D. WS M/S	SKEW WS	NOBS
.020	-6.64	1.61	.0740	3.63	1.50	7.73	1.53	-.26	453.
1.000	-4.66	2.46	-.4217	1.93	2.29	5.55	2.43	.07	455.
2.000	-4.87	3.43	-.3237	.17	2.91	5.94	2.93	.41	454.
3.000	-5.72	3.78	-.3175	-.57	2.95	6.82	3.07	.30	454.
4.000	-5.72	3.79	-.1042	-.77	3.10	6.85	3.20	.70	453.
5.000	-5.45	3.70	-.1302	-.47	3.35	6.73	3.10	.65	453.
6.000	-5.62	4.05	-.1417	-.68	3.25	7.02	3.12	.34	452.
7.000	-4.92	4.70	-.0233	-1.28	3.46	6.96	3.30	.29	452.
8.000	-2.97	5.93	-.0424	-1.59	4.12	7.03	3.71	.39	451.
9.000	-.10	7.10	-.0762	-1.87	5.00	7.83	4.22	.60	450.
10.000	2.71	7.98	-.0675	-2.66	5.78	9.30	5.00	.80	449.
11.000	5.31	8.96	.0176	-3.64	6.33	11.19	6.17	.69	449.
12.000	7.95	9.31	-.0133	-5.13	6.53	12.92	7.20	.49	449.
13.000	10.39	10.07	-.0939	-5.40	6.73	14.83	7.98	.42	449.
14.000	11.20	10.81	-.1734	-4.30	6.45	15.26	8.31	.34	448.
15.000	8.29	10.20	-.0413	-3.19	5.95	12.93	7.13	.63	446.
16.000	2.38	7.72	-.0763	-2.75	4.99	8.75	4.58	.72	445.
17.000	-2.83	5.28	-.1716	-2.13	3.91	6.65	3.38	.55	433.
18.000	-4.61	4.70	-.0476	-.69	3.11	6.43	3.49	.82	440.
19.000	-4.06	6.15	-.0155	-.18	2.49	6.60	4.11	.74	439.
20.000	-5.74	8.88	-.1084	.10	2.57	8.85	6.32	.64	434.
21.000	-8.61	11.35	-.1627	.48	2.87	11.64	8.70	.46	425.
22.000	-12.12	12.76	-.1323	1.10	3.10	14.39	10.67	.34	423.
23.000	-14.92	12.62	-.0543	1.07	2.76	16.24	11.27	.27	413.
24.000	-17.28	12.52	-.0235	.65	3.41	18.44	11.29	.13	416.
25.000	-17.65	11.23	.0848	-.73	3.18	18.57	10.51	.27	408.
26.000	-17.45	10.50	.0716	-1.45	2.57	17.95	10.05	.22	393.
27.000	-17.07	11.37	.0453	-1.86	2.69	17.92	10.50	.24	363.
28.000	-16.61	12.71	.0529	-1.62	2.64	18.02	11.05	.28	358.
29.000	-17.09	14.21	.0484	-1.21	3.00	18.96	12.03	.23	277.
30.000	-17.08	14.62	.0336	-.97	2.70	18.66	12.57	.29	208.
32.000	-18.12	14.80	.0272	-.48	3.70	20.25	12.24	-.07	59.
34.000	-19.16	14.37	.0333	.57	2.99	19.78	12.38	.19	59.
36.000	-17.60	13.05	-.0822	.44	3.63	18.81	11.78	.25	59.
38.000	-15.54	11.85	.1542	.16	4.19	16.64	11.03	.55	59.
40.000	-16.74	12.67	.0379	.81	4.47	17.88	11.71	.38	59.
42.000	-22.25	14.58	.1227	1.79	4.90	23.19	14.02	.70	59.
44.000	-29.78	15.04	.1541	-.11	4.83	30.25	14.85	.58	59.
46.000	-30.26	16.12	-.1025	-2.41	5.34	30.83	15.80	.28	59.
48.000	-44.45	17.54	-.0589	-3.81	6.30	45.19	17.16	.74	59.
50.000	-47.26	20.08	.0931	-5.48	6.47	48.66	18.44	.51	59.
52.000	-49.48	20.67	.2186	-6.85	6.77	50.03	18.07	.34	59.
54.000	-42.17	22.88	-.0213	-7.72	5.81	45.08	19.02	-.26	59.
56.000	-32.90	23.55	.0302	-7.32	8.12	38.69	19.20	-.15	55.
58.000	-20.45	25.45	-.0494	-7.12	8.04	26.94	18.34	.55	48.
60.000	-12.93	24.17	-.0466	-4.83	10.15	22.97	18.46	1.39	33.
62.000	-9.58	24.65	.1527	-4.44	12.48	23.65	17.47	1.14	23.
64.000	-1.26	12.54	.3351	-6.45	9.47	15.36	7.15	.96	16.
66.000	-8.23	15.04	.4519	.87	6.86	15.66	7.73	-.03	7.

TABLE I-13. WIND STATISTICAL PARAMETERS

ANNUAL

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	MEAN U M/S	S.D. U M/S	R(U,V)	MEAN V M/S	S.D. V M/S	MEAN WS M/S	S.D. WS M/S	SKEW WS	NOBS
.020	-6.90	1.86	.0699	3.59	1.71	8.00	1.71	-.14	5716.
1.000	-5.45	2.77	-.3353	2.71	2.26	6.49	2.78	.03	5714.
2.000	-3.75	4.30	-.2035	.38	2.78	5.54	3.11	.85	5710.
3.000	-3.25	4.79	-.1774	-.75	2.65	5.75	3.12	.71	5707.
4.000	-3.10	4.47	[illegible]	-.69	2.00	5.44	3.03	.63	5705.
5.000	-3.51	4.22	-.1391	-.49	3.03	5.55	2.95	.69	5707.
6.000	-4.02	4.77	-.1567	-.29	3.38	6.39	3.30	.70	5710.
7.000	-3.70	5.45	[illegible]	-.18	3.81	6.75	3.52	.83	5707.
8.000	-2.25	6.30	-.0921	-.23	4.43	7.09	3.76	.75	5693.
9.000	-.26	7.24	-.0370	-.93	5.19	7.84	4.34	.87	5697.
10.000	1.68	8.09	-.0215	-2.13	5.95	9.06	5.12	.88	5680.
11.000	3.53	9.23	.0676	-3.51	6.75	10.07	6.11	.78	5665.
12.000	5.76	9.97	.0701	-3.93	6.61	12.01	6.90	.75	5660.
13.000	7.79	10.70	.0375	-3.72	6.49	13.18	7.59	.72	[illegible]
14.000	8.71	10.81	-.0273	-2.81	6.05	13.28	7.81	.71	5653.
15.000	6.65	9.68	-.0350	-2.00	5.30	11.21	6.69	.68	5644.
16.000	2.13	7.40	-.0618	-1.58	4.27	7.72	4.53	1.03	5627.
17.000	-1.65	5.69	-.0846	-.90	3.48	6.05	3.38	.81	5542.
18.000	-2.60	6.11	-.0059	-.04	3.21	6.33	3.78	.97	5534.
19.000	-2.03	7.08	.0051	.18	2.75	6.64	4.23	1.04	5502.
20.000	-3.21	9.05	-.0509	.40	2.66	8.20	5.57	.92	5438.
21.000	-5.65	11.27	-.0072	.59	2.91	10.59	7.45	.75	5314.
22.000	-8.55	12.76	-.0547	.77	3.06	12.93	8.80	.65	5203.
23.000	-10.73	12.65	-.0275	.73	2.69	14.24	9.26	.49	5190.
24.000	-12.64	13.47	-.0274	.51	3.31	16.06	9.72	.35	5120.
25.000	-13.99	13.43	-.0314	-.10	3.10	17.01	9.62	.30	5022.
26.000	-14.02	13.73	-.0301	-.66	2.84	17.66	10.25	.22	4810.
27.000	-15.37	14.60	-.0320	-1.16	3.09	18.49	10.90	.16	4373.
28.000	-15.76	15.17	-.0000	-1.41	2.80	18.96	11.40	.18	4204.
29.000	-16.67	15.80	.0000	-1.37	3.21	20.08	11.73	.14	3346.
30.000	-16.58	15.79	.0312	-1.12	2.96	19.62	11.91	.23	3164.
32.000	-11.22	13.28	.1003	-.23	3.65	16.69	11.27	.53	902.
34.000	-12.45	16.08	.0192	.48	3.76	17.69	11.67	.69	[illegible]
36.000	-13.60	17.78	-.0245	.64	4.10	19.26	12.17	.65	902.
38.000	-13.65	18.12	.0334	.78	4.47	20.08	13.04	.62	863.
40.000	-12.03	21.25	.1081	1.24	5.18	21.01	14.37	.79	863.
42.000	-12.05	24.20	.1039	1.87	5.64	22.33	16.37	1.00	964.
44.000	-10.98	23.86	.2155	1.56	6.85	23.81	18.17	1.19	980.
46.000	-10.37	23.02	.1915	.33	7.27	24.85	19.65	1.37	982.
48.000	-9.34	30.39	.1403	-1.79	7.21	25.47	20.40	1.59	979.
50.000	-5.88	23.77	.1484	-3.71	7.39	24.93	19.21	1.61	972.
52.000	-1.36	29.01	.1036	-4.24	7.87	24.37	16.52	1.40	953.
54.000	4.18	25.72	.1337	-3.60	8.51	23.70	14.27	.99	935.
56.000	9.25	23.06	.1571	-2.07	9.34	23.53	13.57	.78	884.
58.000	14.18	21.67	.1219	-.05	10.10	24.18	13.77	.70	759.
60.000	17.91	21.49	.0903	2.09	11.02	26.25	14.37	.65	574.
62.000	20.68	23.27	.1204	3.56	13.06	29.84	16.33	.49	428.
64.000	22.90	20.91	.1516	3.55	13.53	30.39	15.31	.62	261.
66.000	22.90	23.63	.1235	5.39	14.37	32.13	17.45	.48	117.

TABLE II-1. THERMODYNAMIC STATISTICAL PARAMETERS

JANUARY

STATION = 619030 ASCENSION (WIDE AWAKE)

Z KM	MEAN P MB	S.D. P MB	SKEW P	MEAN T DEG K	S.D. T DEG K	SKEW T	MEAN D G/M3	S.D. D G/M3	SKEW D	NOBS P	NOBS T	NOBS D
.000	1006.5000	1.4453	.03	[illegible]	1.27	-.22	1101.0000	[illegible]	.19	460.	460.	460.
.020	1004.2000	1.5237	.03	[illegible]	1.25	-.24	1159.0000	6.0620	.19	493.	493.	493.
1.000	903.5600	1.3435	.14	291.05	1.22	.39	1074.0000	4.9730	-.28	493.	493.	493.
2.000	803.7000	1.2595	-.04	[illegible]	1.72	-.61	955.4000	5.6740	.53	493.	493.	493.
3.000	714.0200	[illegible]	.11	283.99	1.19	-.51	873.9000	3.6070	.32	493.	493.	493.
4.000	632.3000	1.2463	.04	277.45	1.20	-.10	793.7000	3.5270	-.02	492.	492.	492.
5.000	[illegible]	1.1643	.03	272.00	1.34	-.55	714.6000	[illegible]	.29	492.	492.	492.
6.000	492.7200	1.1174	.14	265.51	1.33	-.21	[illegible]	3.3190	.02	492.	492.	492.
7.000	[illegible]	1.1132	.12	260.04	1.35	-.72	573.3000	[illegible]	.37	492.	492.	492.
8.000	379.2300	1.1107	.07	253.03	1.28	-.59	521.4000	[illegible]	-.16	493.	493.	493.
9.000	330.6500	1.1036	-.03	245.47	1.33	-.34	466.0000	2.6030	-.69	493.	493.	493.
10.000	287.4600	1.1336	-.03	237.56	1.38	-.01	420.9000	2.6010	-.80	493.	493.	493.
11.000	249.6600	1.1191	-.03	229.65	1.43	.04	377.2000	1.7450	.26	492.	492.	492.
12.000	213.7700	1.0721	.01	221.95	1.29	.00	335.5000	1.5550	.02	492.	492.	492.
13.000	183.1100	1.0318	.14	214.60	1.33	.44	297.1000	1.7710	-1.19	492.	492.	492.
14.000	155.9600	.9475	.33	203.06	1.50	.50	261.1000	2.0300	-1.17	492.	492.	492.
15.000	132.1300	.8603	.43	202.15	1.89	.42	227.7000	2.1320	-.68	491.	491.	491.
16.000	111.5000	.7783	.33	197.71	2.02	.40	195.5000	2.0300	-.03	490.	490.	490.
17.000	93.8560	.6934	.30	195.43	2.05	-.03	167.3000	2.0550	.24	485.	485.	485.
18.000	78.0370	.6040	.29	193.52	2.60	.42	139.5000	2.0910	-.19	485.	485.	485.
19.000	65.5410	.5340	.29	200.99	2.67	.28	115.3000	1.6350	.04	483.	483.	483.
20.000	55.3470	.4827	.34	205.63	2.59	.09	95.4500	1.1790	.31	479.	479.	479.
21.000	47.0050	.4502	.40	209.47	2.43	.26	79.6100	.8401	.39	472.	472.	472.
22.000	40.7330	.4232	.44	212.39	2.28	.27	66.8700	.6930	.09	470.	470.	470.
23.000	34.9070	.3836	.49	214.49	2.07	.32	56.5300	.5850	.11	464.	464.	464.
24.000	29.7430	.3352	.40	216.40	2.35	.18	47.5000	.6294	.03	458.	458.	458.
25.000	25.4610	.3187	[illegible]	218.51	2.53	.21	40.3000	.5993	.12	454.	454.	454.
26.000	21.2340	.2834	.22	221.06	2.61	.06	34.4100	.5331	.34	440.	440.	440.
27.000	18.7500	.2494	.03	223.04	2.62	-.02	29.2200	.4543	.27	414.	414.	414.
28.000	16.1430	.2231	-.02	223.07	2.55	-.10	24.8000	.4008	.18	410.	410.	410.
29.000	13.9240	.1933	-.04	226.44	2.63	-.18	21.2400	.3541	.28	347.	347.	347.
30.000	12.0210	.1703	-.10	230.49	2.58	-.35	18.1700	.2904	.17	339.	339.	339.
32.000	8.9772	.1323	-.23	233.67	3.23	.14	13.3300	.2104	.04	75.	77.	75.
34.000	6.7301	.1125	-.02	[illegible]	3.65	.04	9.9060	.1551	-.15	75.	77.	75.
36.000	5.0228	.0959	.13	241.15	4.20	.24	7.3420	.1291	-.36	75.	77.	75.
38.000	3.8365	.0851	.10	245.59	5.03	.18	5.4490	.1010	-.02	73.	75.	73.
40.000	2.9459	.0755	.07	[illegible]	5.35	-.27	4.0550	.0869	-.24	73.	75.	73.
42.000	2.2673	.0657	-.06	[illegible]	5.28	-.03	3.0780	.0704	.15	73.	75.	73.
44.000	1.7508	.0562	-.23	263.53	4.68	-.01	2.3040	.0595	.40	72.	73.	72.
46.000	1.3053	.0476	-.34	267.13	4.65	-.51	1.7770	.0493	.15	71.	69.	71.
48.000	1.0512	.0403	-.33	[illegible]	5.02	-.15	1.3760	.0447	-.08	69.	66.	69.
50.000	.9287	.0329	[illegible]	[illegible]	6.17	.42	1.0590	.0373	-.19	68.	65.	68.
52.000	.6464	.0274	[illegible]	270.09	6.17	.56	.8333	.0334	-.52	67.	68.	67.
54.000	.5035	.0225	-.26	263.21	6.04	.13	.6510	.0271	-.27	64.	64.	64.
56.000	.3923	.0188	-.18	267.60	6.57	.10	.5100	.0222	-.39	61.	62.	61.
58.000	.3045	.0150	.07	[illegible]	7.15	.35	.4013	.0181	-.47	56.	55.	56.
60.000	.2351	.0119	.22	[illegible]	8.30	.34	.3159	.0135	-.16	49.	50.	49.
62.000	.1601	.0037	.40	[illegible]	8.03	.63	.2453	.0101	-.07	37.	38.	37.
64.000	.1375	.0031	[illegible]	[illegible]	9.42	1.22	.1913	[illegible]	-.15	[illegible]	28.	29.
[illegible]	.1058	[illegible]	[illegible]	[illegible]	10.10	1.23	.1529	.0063	-.87	10.	11.	10.

TABLE II-2. THERMODYNAMIC STATISTICAL PARAMETERS

FEBRUARY

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	MEAN P MB	S.D. P MB	SKEW P	MEAN T DEG K	S.D. T DEG K	SKEW T	MEAN D G/M3	S.D. D G/M3	SKEW D	NOBS P	NOBS T	NOBS D
.000	1006.3000	1.7199	.17	300.30	1.16	-.26	1157.0000	5.9550	.30	424.	424.	424.
.020	1004.0000	1.7084	.17	300.19	1.15	-.24	1154.0000	5.9310	.29	446.	446.	446.
1.000	903.6300	1.4936	.18	291.85	1.13	.20	1071.0000	4.7020	-.27	450.	450.	450.
2.000	804.0800	1.3612	.28	288.10	1.50	-.49	963.4900	5.0730	.32	449.	449.	449.
3.000	714.2700	1.3050	.43	283.09	1.27	-.07	875.0000	3.9160	.04	449.	449.	449.
4.000	632.7500	1.2879	.43	277.53	1.35	.13	792.5000	3.7010	.02	449.	449.	449.
5.000	559.2100	1.2533	.53	272.40	1.37	-.24	714.2000	3.4070	-.02	449.	449.	449.
6.000	493.0400	1.2301	.52	266.20	1.44	-.15	642.0000	3.2410	.03	448.	448.	448.
7.000	433.3300	1.2637	.45	260.50	1.37	-.04	579.0000	2.8000	.02	448.	448.	448.
8.000	379.5300	1.3102	.33	253.93	1.31	.07	520.5000	2.4490	-.09	448.	448.	448.
9.000	331.3500	1.3042	.35	246.13	1.33	-.17	468.4000	2.3550	-.18	448.	448.	449.
10.000	285.0000	1.3110	.33	238.15	1.34	-.41	420.8000	2.1630	-.31	449.	449.	449.
11.000	246.2200	1.2914	.22	230.18	1.42	-.25	377.2000	1.5830	.27	449.	449.	449.
12.000	214.3000	1.2523	.28	222.33	1.44	.30	335.8000	1.5150	.02	449.	449.	449.
13.000	183.6000	1.2091	.24	214.87	1.50	.73	237.7000	1.6580	-.75	449.	449.	449.
14.000	155.5200	1.1375	.30	207.95	1.58	.52	262.0000	1.5400	-1.25	449.	449.	449.
15.000	132.4200	1.0537	.51	201.93	1.84	.33	223.3000	1.9250	-.52	448.	448.	448.
16.000	111.7800	.9781	.55	197.55	1.65	.11	197.1000	1.9220	-.23	448.	448.	448.
17.000	94.0910	.6716	.57	193.36	1.94	.56	167.8000	2.1230	-.09	445.	445.	445.
18.000	79.1030	.7425	.54	196.50	2.73	.32	140.3000	2.4090	.21	442.	442.	442.
19.000	65.7050	.6298	.50	200.78	2.73	.31	115.8000	1.8420	.42	441.	441.	441.
20.000	56.4600	.5552	.37	205.14	2.85	.25	95.9000	1.3470	.44	438.	438.	438.
21.000	47.9420	.5224	.35	209.07	2.76	.51	79.6200	1.0100	.40	421.	421.	421.
22.000	40.8220	.4926	.37	212.14	2.49	.12	67.0400	.7347	.29	419.	419.	419.
23.000	34.8450	.4479	.38	214.52	2.34	.25	56.6000	.6651	-.17	411.	411.	411.
24.000	29.7770	.4103	.33	216.53	2.63	.43	47.9100	.5932	-.11	403.	403.	403.
25.000	25.4950	.3084	.31	219.29	2.91	.33	40.0100	.6509	.00	397.	397.	397.
26.000	21.8640	.3230	.01	221.51	2.78	.21	34.3200	.5491	.21	385.	385.	385.
27.000	18.7950	.2834	-.10	224.13	2.72	.15	29.2200	.4893	.23	348.	348.	348.
28.000	16.1760	.2541	-.16	226.64	2.71	.05	24.6300	.4334	.05	339.	339.	339.
29.000	13.9530	.2168	-.13	229.30	2.71	.30	21.2000	.3578	.11	280.	280.	280.
30.000	12.0520	.1521	-.20	231.11	2.65	.09	18.1700	.3084	.21	275.	275.	275.
32.000	9.0410	.1506	.12	234.81	3.65	.24	13.4200	.1912	.29	65.	68.	66.
34.000	5.7350	.1334	.10	239.33	3.77	.73	9.9400	.1450	-.35	66.	68.	65.
36.000	5.1313	.1136	.24	242.57	4.10	-.24	7.3690	.1618	-.30	66.	68.	66.
38.000	3.9056	.0942	.19	250.07	4.57	-.22	5.4420	.1188	-.17	66.	68.	66.
40.000	2.9957	.0803	.01	257.29	5.28	-.67	4.0560	.0935	.40	66.	68.	66.
42.000	2.3156	.0699	-.13	265.11	6.17	-.25	3.0380	.0714	-.09	66.	64.	66.
44.000	1.8020	.0615	-.14	270.13	3.57	.19	2.3220	.0585	.04	66.	64.	66.
46.000	1.4075	.0515	-.14	272.49	5.03	.09	1.7390	.0574	-.02	68.	64.	68.
48.000	1.1021	.0441	.07	272.31	4.95	.19	1.4090	.0537	-.03	69.	60.	69.
50.000	.8803	.0376	.11	271.22	4.73	.93	1.1040	.0480	.06	69.	62.	68.
52.000	.6707	.0256	.15	268.58	5.67	-.23	.8701	.0401	.32	68.	67.	68.
54.000	.5224	.0212	.06	265.23	6.35	.08	.6232	.0285	.52	69.	68.	69.
56.000	.4064	.0175	.01	264.04	7.25	-.64	.5353	.0227	1.10	66.	67.	66.
58.000	.3147	.0143	.09	261.42	6.33	-.25	.4135	.0160	-.05	63.	64.	63.
60.000	.2418	.0121	.13	257.50	10.10	-.11	.3275	.0129	-.01	55.	56.	55.
62.000	.1825	.0111	.13	255.14	11.10	-.07	.2549	.0088	.01	46.	47.	46.
64.000	.1414	.0095	.16	252.41	11.25	.36	.1937	.0070	-.06	28.	28.	28.
66.000	.1044	.0078	1.22	250.71	12.16	1.13	.1510	.0039	-.41	11.	11.	11.

TABLE II-3. THERMODYNAMIC STATISTICAL PARAMETERS

MARCH

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	MEAN P MB	S.D. P M3	SKEW P	MEAN T DEG K	S.D. T DEG K	SKEW T	MEAN D G/M3	S.D. D G/M3	SKEW D	NOBS P	NOBS T	NOBS D
.000	1006.0000	1.4761	.23	300.98	1.08	-.32	1153.0000	5.0460	.20	466.	466.	466.
.020	1003.7000	1.4762	.24	300.65	1.08	-.36	1151.0000	4.9770	.21	480.	480.	480.
1.000	903.5300	1.3591	.16	292.51	.93	-.04	1069.0000	4.0050	.16	480.	480.	480.
2.000	804.1500	1.2233	.23	286.75	1.32	-.49	969.2000	4.6370	.63	480.	480.	480.
3.000	714.3200	1.2331	.23	283.67	1.15	-.13	974.5000	3.4930	.21	480.	480.	480.
4.000	632.8900	1.2037	.13	277.95	1.13	.01	791.6000	3.3100	-.03	480.	480.	480.
5.000	559.4100	1.1232	.26	272.66	1.22	.05	713.0000	3.3450	.00	480.	480.	480.
6.000	493.2200	1.0919	.28	267.08	1.15	.06	642.5000	2.9120	.03	480.	480.	480.
7.000	433.6000	1.0628	.37	260.84	1.09	.37	578.3000	2.4750	-.16	480.	480.	480.
8.000	379.9300	1.0434	.53	254.10	1.14	.22	520.2000	2.3390	.05	480.	480.	480.
9.000	331.7400	1.0375	.51	245.83	1.21	-.14	467.6000	2.3320	-.30	480.	480.	480.
10.000	288.4500	1.0516	.40	237.92	1.25	-.05	420.0000	2.1460	-.48	479.	479.	479.
11.000	249.7300	1.0472	.30	230.84	1.27	-.13	376.8000	1.5040	-.26	479.	479.	479.
12.000	214.8000	1.0335	.39	222.76	1.23	-.10	335.9000	1.3530	.40	479.	479.	479.
13.000	184.0700	.9319	.37	214.91	1.26	.27	298.4000	1.3500	-.35	479.	479.	479.
14.000	153.7600	.9436	.44	207.60	1.40	.18	263.1000	1.5220	-.72	479.	479.	479.
15.000	132.7600	.8761	.45	201.49	1.58	.13	229.5000	1.7300	-.65	478.	478.	478.
16.000	111.5600	.8025	.47	197.00	1.59	.14	198.0000	1.7450	-.12	478.	478.	478.
17.000	94.1040	.7057	.49	194.66	1.67	-.17	168.4000	1.9750	.06	473.	473.	473.
18.000	79.1780	.5364	.59	196.57	2.84	.33	140.3000	2.3210	-.13	474.	474.	474.
19.000	66.7710	.4917	.57	201.22	2.56	.06	115.3000	1.6410	.11	473.	473.	473.
20.000	56.5510	.4453	.42	205.03	2.46	.15	95.7400	1.1340	.32	470.	470.	470.
21.000	48.0420	.4120	.20	209.60	2.23	.18	79.6500	.8411	.30	450.	450.	450.
22.000	40.9320	.3839	.22	213.11	2.14	.21	66.0200	.7754	.09	450.	450.	450.
23.000	34.9750	.3366	.21	215.72	1.98	.38	56.4000	.6309	.13	445.	445.	445.
24.000	29.9110	.3043	.14	218.19	2.32	.25	47.7600	.6317	.17	447.	447.	447.
25.000	25.6330	.2687	.06	220.39	2.55	.11	40.5390	.5795	.05	443.	443.	443.
26.000	22.0170	.2332	.01	222.91	2.50	.04	34.4300	.4858	.27	429.	429.	429.
27.000	18.9290	.2046	.02	225.22	2.47	-.22	29.2800	.4143	.40	396.	396.	396.
28.000	16.3040	.1823	.05	227.75	2.46	-.22	24.9400	.3353	.20	386.	386.	386.
29.000	14.0760	.1620	.09	230.10	2.59	-.33	21.3100	.3097	.15	307.	307.	307.
30.000	12.1670	.1459	.10	232.10	2.44	-.36	18.2600	.2449	.13	300.	300.	300.
32.000	9.0755	.1458	-.46	235.59	3.78	-.36	13.4100	.2043	-.28	90.	94.	90.
34.000	6.8342	.1275	-.48	239.61	4.24	-.06	9.9280	.1653	.18	90.	94.	90.
36.000	5.1731	.1139	-.37	244.60	4.61	-.19	7.3560	.1184	-.42	90.	94.	90.
38.000	3.9459	.0926	-.30	251.60	5.53	-.51	5.4540	.1006	-.61	90.	94.	90.
40.000	3.0341	.0674	-.24	259.73	6.12	-.09	4.0530	.0844	.03	89.	92.	89.
42.000	2.3515	.0775	-.23	266.33	5.82	-.44	3.0050	.0769	.13	88.	87.	88.
44.000	1.8322	.0650	-.43	270.61	5.42	-.05	2.3340	.0756	.53	89.	80.	89.
46.000	1.4305	.0530	-.55	272.11	4.81	.15	1.8300	.0525	.10	87.	85.	87.
48.000	1.1165	.0428	-.61	271.27	4.78	-.46	1.4320	.0530	-.25	85.	83.	85.
50.000	.8716	.0343	-.63	269.31	5.35	-.15	1.1250	.0440	-.21	85.	81.	85.
52.000	.6790	.0277	-.62	265.52	5.68	.17	.8057	.0341	-.27	85.	83.	85.
54.000	.5273	.0225	-.57	264.20	6.52	.50	.6941	.0286	-.33	84.	86.	84.
56.000	.4003	.0184	-.42	261.43	7.01	.21	.5440	.0219	-.41	83.	88.	83.
58.000	.3150	.0155	-.20	257.57	7.09	.04	.4256	.0163	-.31	79.	83.	79.
60.000	.2417	.0131	-.03	254.07	7.23	.08	.3314	.0137	-.26	74.	79.	74.
62.000	.1879	.0031	.27	249.57	6.71	.33	.2504	.0099	-.26	54.	59.	54.
64.000	.1360	.0032	.83	243.40	7.25	.71	.1972	.0081	.28	34.	37.	34.
66.000	.1041	.0067	1.64	237.63	8.58	1.52	.1521	.0047	.78	13.	15.	13.

TABLE II-4. THERMODYNAMIC STATISTICAL PARAMETERS

APRIL

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	MEAN P MB	S.D. P MB	SKEW P	MEAN T DEG K	S.D. T DEG K	SKEW T	MEAN D G/M3	S.D. D G/M3	SKEW D	NOBS P	NOBS T	NOBS D
.000	1006.1000	1.3733	.03	301.03	1.17	-.73	1153.0000	5.6200	.57	422.	422.	422.
.020	1003.8000	1.3413	.03	300.93	1.17	-.66	1151.0000	5.5500	.53	448.	448.	448.
1.000	903.7200	1.2101	.21	292.50	1.02	.14	1059.0000	4.2410	-.10	459.	459.	459.
2.000	804.2400	1.1133	.34	289.92	1.48	-.16	[illegible]	4.7330	.03	459.	459.	459.
3.000	714.4000	1.0970	.34	284.03	1.11	-.47	873.7000	3.6350	.07	459.	459.	459.
4.000	633.0700	1.0345	.31	278.42	1.07	.09	790.4000	3.4140	-.27	459.	459.	453.
5.000	559.6600	.9910	.22	272.92	1.05	-.03	712.6000	3.1600	-.32	459.	459.	459.
6.000	493.5700	.9991	.09	267.26	1.18	-.24	642.2000	2.9370	-.15	459.	459.	459.
7.000	433.9100	1.0139	.14	261.18	1.15	-.14	577.7000	2.6040	-.42	459.	459.	459.
8.000	356.3300	1.0170	.01	254.67	1.03	-.12	519.3000	2.5130	-.69	457.	457.	457.
9.000	332.1500	1.0033	-.01	247.52	1.12	.01	465.5000	2.7760	-.78	457.	457.	457.
10.000	288.9400	1.0161	-.01	239.54	1.18	.01	410.3000	2.5490	-1.00	456.	455.	455.
11.000	250.2700	[illegible]	-.05	231.50	1.21	-.18	376.[illegible]	1.6510	-.94	454.	454.	454.
12.000	215.7300	.9752	.02	223.33	1.14	-.14	335.6000	1.1800	.20	455.	455.	455.
13.000	184.6100	.9371	.01	215.34	1.17	.18	299.7000	1.0930	-.21	455.	455.	455.
14.000	157.2400	.9106	.05	207.71	1.31	-.05	263.7000	1.1040	.31	455.	455.	455.
15.000	133.1600	.8360	.09	201.03	1.44	.17	230.7000	1.4550	-.27	453.	453.	453.
16.000	112.2400	.8101	.13	195.23	1.51	.23	193.3000	1.5550	-.18	453.	453.	453.
17.000	94.3750	.7209	.22	194.16	1.70	.32	163.3000	1.9530	-.03	449.	449.	449.
18.000	79.2630	.6116	.35	196.54	2.72	.10	140.6000	2.3160	.24	448.	448.	448.
19.000	66.0370	.5181	.57	201.77	2.74	-.25	115.5000	1.8290	.28	445.	445.	445.
20.000	53.6[illegible]	.4508	.41	205.49	2.23	-.20	95.8700	1.1850	.24	443.	443.	443.
21.000	43.1800	.3329	.47	210.63	2.24	.14	79.7100	[illegible]	.17	432.	432.	432.
22.000	41.0930	.3537	.50	214.20	2.29	.23	66.6400	.6903	-.06	432.	432.	432.
23.000	35.1470	.3089	.44	217.30	2.08	.23	55.3500	.6844	.00	424.	424.	424.
24.000	30.0310	.2776	.43	220.26	2.41	.46	47.6000	.6413	-.06	419.	419.	419.
25.000	25.8720	.2422	.27	222.53	2.52	.23	40.4400	.5504	.18	412.	412.	412.
26.000	22.2100	.2134	.17	[illegible]	2.42	-.04	34.4400	.4521	.48	404.	404.	404.
27.000	19.1180	.1835	.09	[illegible]	2.47	-.13	29.3500	.3822	.37	373.	373.	373.
28.000	16.4950	.1000	.04	[illegible]	2.23	-.17	25.0000	.3073	.47	351.	361.	351.
29.000	14.2490	.1603	-.57	231.56	2.19	-.10	21.4400	.2806	.30	275.	275.	275.
30.000	12.3260	.1424	-.15	233.47	2.04	-.23	18.4000	.2175	.18	268.	268.	268.
32.000	9.2019	.1439	.03	237.05	3.35	.01	13.5300	.2540	.45	75.	84.	75.
34.000	6.9406	.1339	-.32	241.92	3.81	-.41	9.9300	.1810	.17	75.	84.	75.
36.000	5.2700	.1036	-.40	247.60	4.32	-.11	7.4070	.1212	-.51	75.	84.	75.
38.000	4.0237	.0937	-.35	[illegible]	4.39	-.55	5.5240	.1014	-.07	75.	84.	75.
40.000	3.0297	.0777	-.25	[illegible]	4.90	-.41	4.1420	.0704	.02	75.	84.	75.
42.000	2.4033	.0641	-.33	[illegible]	4.62	-.05	3.1530	.0558	-.05	75.	83.	75.
44.000	1.8704	.0530	-.33	[illegible]	4.24	-.11	2.4130	.0519	-.41	75.	80.	75.
46.000	1.4532	.0433	-.32	270.54	3.48	-.26	1.8780	.0519	-.39	75.	79.	75.
48.000	1.1295	.0335	-.27	272.03	3.50	-.30	1.4580	.0426	.06	75.	77.	75.
50.000	.8097	.0257	-.23	[illegible]	3.95	-.74	1.1520	.0330	.03	74.	76.	74.
52.000	.6915	.0212	-.27	[illegible]	4.05	-.58	.9062	.0280	.00	74.	82.	74.
54.000	.5365	.0173	-.15	262.94	5.29	-.14	.7109	.0215	-.26	73.	81.	73.
56.000	.4153	.0142	.02	[illegible]	6.10	.05	.5578	.0153	-.05	70.	79.	70.
58.000	.3133	.0120	.18	[illegible]	7.23	.07	.4305	.0123	-.20	68.	76.	68.
60.000	.2445	.0099	.35	[illegible]	7.33	.26	.3384	.0106	-.23	61.	68.	61.
62.000	.1832	.0677	.60	[illegible]	7.93	1.33	.2510	.0079	-.79	51.	56.	51.
64.000	.1393	.0052	1.00	[illegible]	7.36	.63	.2021	.0052	-.11	27.	31.	27.
66.000	.1057	.0057	1.14	[illegible]	12.15	.95	.1549	.0033	-.59	10.	12.	10.

TABLE II-5. THERMODYNAMIC STATISTICAL PARAMETERS

MAY

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	MEAN P MB	S.D. P MB	SKEW P	MEAN T DEG K	S.D. T DEG K	SKEW T	MEAN D G/M3	S.D. D G/M3	SKEW D	NOBS P	NOBS T	NOBS D
.000	1007.4000	1.4050	.18	301.52	.95	-.28	1157.0000	4.4940	.14	412.	412.	412.
.020	1005.2000	1.3339	.12	300.43	.96	-.17	1155.0000	4.5410	.03	469.	469.	469.
1.000	904.5600	1.2448	.27	291.75	1.01	.03	1073.0000	4.2050	-.03	488.	488.	488.
2.000	804.7300	1.1648	.24	283.03	1.75	-.27	989.5000	5.6230	.30	488.	488.	488.
3.000	714.6300	1.1553	.32	284.03	1.36	-.58	874.1000	4.6410	-.07	488.	488.	488.
4.000	633.3100	1.1210	.25	278.58	1.17	-.20	790.1000	3.9550	-.06	488.	488.	488.
5.000	559.9000	1.0133	.15	272.94	1.18	-.13	713.0000	3.7600	-.28	488.	488.	488.
6.000	493.7400	1.0302	.10	267.10	1.24	-.08	642.4000	3.4800	-.45	488.	488.	488.
7.000	434.0300	1.0542	.24	261.06	1.17	.06	577.9000	3.1010	-.60	488.	488.	488.
8.000	380.4400	1.0349	.16	254.53	1.16	-.03	519.3000	3.0510	-.65	486.	486.	486.
9.000	332.2400	1.0872	.18	247.45	1.24	-.14	466.6000	3.1520	-.86	486.	486.	486.
10.000	289.0000	1.1152	.17	239.51	1.21	-.02	419.3000	2.9180	-1.10	485.	485.	485.
11.000	250.3000	1.0858	.14	231.37	1.18	-.07	376.8000	1.6930	-1.09	485.	485.	485.
12.000	215.3500	1.0534	.19	223.26	1.21	.09	335.0000	1.3010	-.07	485.	485.	485.
13.000	184.6100	1.0193	.22	215.29	1.25	.07	295.7000	1.2580	-.50	484.	484.	484.
14.000	157.2500	.9393	.27	207.76	1.23	.34	263.7000	1.3730	-.55	483.	483.	483.
15.000	133.2000	.9073	.24	201.51	1.51	.27	230.3000	1.5380	-.10	482.	482.	482.
16.000	112.3300	.8539	.29	195.96	1.54	-.06	199.7000	1.6580	.03	482.	482.	482.
17.000	94.5350	.7755	.33	195.28	1.81	.23	160.7000	2.0220	.00	475.	475.	475.
18.000	79.5040	.6783	.25	198.01	2.60	-.01	139.9000	2.1800	.16	475.	475.	475.
19.000	67.1680	.6105	.80	202.79	2.31	-.05	115.4000	1.6660	.33	474.	474.	474.
20.000	56.9460	.5050	.62	207.50	2.20	.10	95.6200	1.2650	.52	469.	469.	469.
21.000	48.4440	.4338	.53	211.59	2.17	.06	79.7700	.9971	.28	456.	456.	456.
22.000	41.3410	.4048	.81	215.07	2.05	-.06	66.9700	.8340	.58	455.	455.	455.
23.000	35.3730	.3434	.66	217.90	1.84	-.01	56.5800	.6559	.40	449.	449.	449.
24.000	30.3600	.3043	.55	220.57	2.19	.19	47.9200	.6492	.29	448.	448.	448.
25.000	26.0220	.2533	.43	223.29	2.11	.10	40.5000	.5406	.59	448.	448.	448.
26.000	22.3920	.2223	.14	225.55	2.10	.00	34.5000	.4071	.22	431.	431.	431.
27.000	19.2830	.1943	.00	227.59	2.15	.33	29.5200	.3409	.18	401.	401.	401.
28.000	16.6330	.1740	-.12	229.42	1.63	.31	25.2600	.2732	.05	395.	395.	395.
29.000	14.3530	.1536	-.09	231.08	1.79	.27	21.6500	.2603	.11	335.	335.	335.
30.000	12.4240	.1332	-.07	232.65	1.65	-.24	18.5900	.2375	.09	332.	332.	332.
32.000	9.3[illegible]	.1401	.80	23[illegible].13	4.13	.10	13.6[illegible]	.[illegible]07	.17	64.	66.	64.
34.000	7.0571	.1277	.73	2[illegible].19	4.19	.02	10.1100	.1830	-.11	64.	66.	64.
36.000	5.3623	.1041	.55	248.73	3.76	-.02	7.5000	.1473	.56	63.	65.	63.
38.000	4.1033	.0832	.41	254.54	4.20	-.08	5.6140	.0916	.42	63.	65.	63.
40.000	3.1580	.0759	.33	259.54	4.16	.03	4.2330	.0870	.51	63.	65.	63.
42.000	2.4433	.0627	.26	264.46	3.68	-.18	3.2190	.0756	.38	63.	66.	63.
44.000	1.8983	.0510	.18	267.64	3.97	.37	2.4710	.0618	.34	63.	65.	63.
46.000	1.4777	.0419	.17	269.45	4.21	1.08	1.9110	.0523	.34	61.	61.	61.
48.000	1.1521	.0341	.20	2[illegible]	4.45	.43	1.4[illegible]	.0418	.25	61.	59.	61.
50.000	.8990	.0275	.24	2[illegible]	5.26	.62	1.1500	.0324	.69	60.	62.	60.
52.000	.6936	.0232	.27	265.77	5.51	.28	.9106	.0251	.53	60.	61.	60.
54.000	.5429	.0197	.32	263.33	6.34	.09	.7193	.0213	.23	60.	64.	60.
56.000	.4186	.0171	.56	259.31	6.49	.27	.5324	.0166	.07	58.	61.	58.
58.000	.3234	.0144	.54	255.11	7.23	.29	.4417	.0155	.14	57.	61.	57.
60.000	.2473	.0123	.62	250.69	8.09	.11	.3442	.0125	.49	56.	60.	56.
62.000	.1637	.0104	-.16	245.24	8.72	.15	.2677	.0106	.05	35.	38.	35.
64.000	.1437	.0077	.22	2[illegible].95	9.01	.89	.2103	.0078	-.33	12.	15.	12.
66.000	.9979	.0000	99.99	[illegible]	99.99	99.99	.9999	.0000	99.99	4.	4.	4.

TABLE II-6. THERMODYNAMIC STATISTICAL PARAMETERS

JUNE

STATION = 61S020   ASCENSION (WIDE AWAKE)

Z KM	MEAN P MB	S.D. P MB	SKEW P	MEAN T DEG K	S.D. T DEG K	SKEW T	MEAN D G/M3	S.D. D G/M3	SKEW D	NOBS P	NOBS T	NOBS D
.000	1009.1000	1.6575	.01	299.50	1.11	-.51	1164.0000	5.2580	.20	368.	368.	368.
.020	1006.8000	1.6003	.01	299.44	1.09	-.49	1160.0000	5.1320	.19	426.	426.	426.
1.000	905.0100	1.4534	.23	290.65	1.06	.12	1079.0000	4.4400	.04	447.	447.	447.
2.000	805.2800	1.4449	-.13	289.46	2.03	.05	975.5000	7.0320	-.03	447.	447.	447.
3.000	714.9600	1.3603	-.23	283.75	1.42	-.39	875.7000	4.7760	.25	447.	447.	447.
4.000	633.3400	1.3375	-.03	277.02	1.30	.17	792.3000	4.2700	-.05	447.	447.	447.
5.000	559.7300	1.2518	.04	272.20	1.28	-.22	715.1000	3.8740	.20	447.	447.	447.
6.000	493.4100	1.2593	.20	265.52	1.41	-.25	643.8000	3.5230	.41	447.	447.	447.
7.000	433.6400	1.2650	.49	260.05	1.47	.05	578.7000	3.2970	.03	447.	447.	447.
8.000	379.9000	1.2765	.56	252.90	1.35	.37	520.3000	3.1350	-.47	447.	447.	447.
9.000	331.6800	1.2646	.76	245.50	1.40	.43	457.9000	3.2290	-1.00	444.	444.	444.
10.000	283.3400	1.2679	.81	237.38	1.42	.39	420.6000	2.9140	-1.33	444.	444.	444.
11.000	245.5200	1.2403	.72	230.24	1.49	.34	377.5000	1.7050	-.31	444.	444.	444.
12.000	214.5500	1.2318	.77	222.25	1.40	.35	336.3000	1.5510	-.17	443.	443.	443.
13.000	183.8100	1.1733	.72	214.56	1.30	.72	298.4000	1.5550	-.37	442.	442.	442.
14.000	155.5200	1.1072	.81	207.53	1.48	.72	262.6000	1.6750	-.22	442.	442.	442.
15.000	132.6000	1.0141	.94	202.09	1.61	.34	230.3000	1.9770	.01	439.	439.	439.
16.000	111.9200	.9162	1.00	193.41	1.76	.27	196.0000	2.1130	.09	439.	439.	439.
17.000	94.3120	.8115	1.09	197.45	2.05	-.06	163.4000	2.2330	.21	434.	434.	434.
18.000	79.4940	.6335	1.08	200.35	2.67	-.03	138.3000	2.2920	.48	432.	432.	432.
19.000	67.2670	.5837	.94	203.01	2.41	.04	114.3000	1.7310	.58	431.	431.	431.
20.000	57.1340	.4796	.75	208.41	2.21	.03	95.0000	1.3420	.63	428.	428.	428.
21.000	48.6620	.3929	.57	212.74	2.26	-.04	79.7000	1.1200	.73	416.	416.	416.
22.000	41.5330	.3502	.54	215.62	1.38	-.15	67.1400	.9212	.60	412.	412.	412.
23.000	35.5310	.2936	.35	218.04	1.98	-.04	55.8200	.6714	.65	407.	407.	407.
24.000	30.4540	.2674	.19	220.86	2.27	.30	48.1000	.5913	.25	405.	405.	405.
25.000	26.1030	.2348	.01	223.09	2.21	.29	40.3300	.4740	.49	402.	402.	402.
26.000	22.5000	.2112	-.13	225.17	2.09	.09	34.9100	.3757	.63	385.	385.	385.
27.000	19.3730	.1833	-.28	227.08	2.13	.31	29.7200	.3235	.11	360.	360.	360.
28.000	16.7050	.1702	-.34	229.58	1.58	.34	25.4600	.2735	.14	349.	349.	349.
29.000	14.4220	.1537	-.10	229.96	2.18	.35	21.0500	.2735	.16	294.	294.	294.
30.000	12.4690	.1378	.04	232.09	2.11	-.16	18.7200	.2354	-.04	287.	287.	287.
32.000	9.3457	.1207	.90	237.14	3.60	-.15	13.7400	.2032	.16	55.	56.	55.
34.000	7.0043	.1093	.73	242.19	4.90	-.13	10.1500	.1743	-.10	55.	53.	55.
36.000	5.3343	.0932	.55	245.53	4.30	-.11	7.3370	.1078	-.06	55.	56.	55.
38.000	4.0831	.0859	.45	251.33	3.91	-.28	5.5520	.1012	.12	55.	56.	55.
40.000	3.1341	.0734	.32	255.09	3.68	-.73	4.2510	.0839	.52	55.	56.	55.
42.000	2.4135	.0603	.23	260.14	3.52	-.41	3.2360	.0774	.11	55.	56.	55.
44.000	1.8892	.0490	.13	264.05	3.58	-.66	2.4640	.0553	.41	55.	55.	55.
46.000	1.4519	.0407	-.02	266.33	3.88	-.04	1.8970	.0408	.32	54.	53.	54.
48.000	1.1234	.0341	-.07	267.73	5.01	.55	1.4690	.0362	.10	54.	53.	54.
50.000	.8754	.0259	-.05	267.92	4.93	.35	1.1420	.0317	.27	54.	51.	54.
52.000	.6345	.0241	.01	263.91	5.15	-.30	.8415	.0270	.17	54.	49.	54.
54.000	.5313	.0200	.11	263.54	4.53	-.78	.7026	.0235	-.15	54.	55.	54.
56.000	.4111	.0163	.25	259.59	5.49	-.47	.5617	.0202	-.20	52.	53.	52.
58.000	.3155	.0143	.41	254.62	6.71	-.32	.4319	.0150	.03	47.	48.	47.
60.000	.2421	.0122	.30	249.39	7.51	-.21	.3395	.0130	.15	43.	44.	43.
62.000	.1831	.0109	.34	241.20	7.74	.05	.2644	.0124	-.05	26.	26.	26.
64.000	.1334	.0076	.45	234.16	5.21	-.43	.2014	.0123	.33	15.	15.	15.
66.000	.1034	.0051	.05	229.41	5.42	-.47	.1591	[illegible]	.12	8.	8.	6.

TABLE II-7. THERMODYNAMIC STATISTICAL PARAMETERS

JULY

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	MEAN P MB	S.D. P MB	SKEW P	MEAN T DEG K	S.D. T DEG K	SKEW T	MEAN D G/M3	S.D. D G/M3	SKEW D	NOBS P	NOBS T	NOBS D
.000	1010.4000	1.3598	.33	293.62	.97	-.39	1170.0000	4.6030	.48	396.	396.	396.
.020	1008.1000	1.3913	.26	289.55	.96	-.44	1167.0000	4.4890	.52	451.	451.	451.
1.000	906.5100	1.3399	.33	289.72	1.03	.04	1034.0000	4.2130	.07	461.	461.	461.
2.000	825.[illegible]	1.2709	.05	285.83	2.45	.13	978.3000	7.9990	-.05	461.	461.	461.
3.000	715.0200	1.2901	-.12	282.87	1.44	-.52	678.6000	4.9140	.05	461.	461.	461.
4.000	633.2400	1.2548	-.20	277.36	1.36	-.35	793.9000	4.4010	-.03	461.	461.	461.
5.000	559.5100	1.2094	-.33	272.05	1.32	-.37	715.2000	3.7510	.06	461.	461.	461.
6.000	493.1800	1.2214	-.29	266.35	1.25	.16	643.9000	3.3700	-.36	461.	461.	461.
7.000	433.3500	1.1658	-.20	259.91	1.25	.21	579.8000	3.2770	-.34	460.	460.	460.
8.000	379.5500	1.1638	-.04	252.25	1.29	.01	521.9000	3.2090	-.56	459.	459.	459.
9.000	331.1200	1.1447	-.04	245.23	1.37	.05	469.6000	2.9370	-.86	458.	458.	458.
10.000	287.6300	1.1575	-.02	237.14	1.36	-.16	421.9000	2.6[illegible]0	-1.04	455.	455.	455.
11.000	243.7400	1.1420	-.12	229.12	1.41	.04	378.2000	1.7020	.19	454.	454.	454.
12.000	213.7600	1.1049	-.11	221.22	1.27	.03	336.5000	1.4960	.13	453.	453.	453.
13.000	193.0200	1.0637	-.11	213.99	1.39	.17	297.9000	1.5810	-.19	450.	450.	450.
14.000	155.8100	.9901	-.05	207.64	1.41	-.07	251.4000	1.7900	-.15	450.	450.	450.
15.000	132.0300	.9072	.03	202.62	1.50	.19	227.0000	1.8090	-.02	449.	449.	449.
16.000	111.5300	.8055	.14	193.39	1.48	.04	194.9000	1.7670	.08	447.	447.	447.
17.000	94.0370	.7066	.22	193.35	1.88	-.02	164.4000	2.0750	.21	441.	441.	441.
18.000	79.4700	.6153	.40	202.39	2.37	-.07	135.5000	1.9700	.13	441.	441.	441.
19.000	67.3760	.5296	.65	207.03	2.39	.08	113.4000	1.6200	.24	440.	440.	440.
20.000	57.3100	.4739	.77	210.93	2.23	.08	94.5700	1.2470	.34	430.	430.	430.
21.000	48.8580	.3751	.67	214.01	2.19	.19	79.5300	1.0010	.36	416.	416.	416.
22.000	41.7800	.3374	.74	216.20	2.31	.48	67.3000	.8509	-.01	411.	411.	411.
23.000	35.7470	.2939	.62	218.23	2.24	.59	57.0700	.6466	-.06	405.	405.	405.
24.000	30.6230	.2692	.48	220.02	2.40	.43	48.4900	.5067	.24	406.	406.	406.
25.000	26.2890	.2234	.13	222.19	2.33	.32	41.2200	.4727	.38	391.	391.	391.
26.000	22.5940	.2057	.04	224.29	2.29	.30	35.1000	.4010	.67	381.	381.	381.
27.000	19.4430	.1639	-.04	225.19	2.28	.26	29.9500	.3297	.19	357.	357.	357.
28.000	16.7550	.1591	.07	227.49	2.11	.09	25.6500	.2537	.02	350.	350.	350.
29.000	14.4470	.1495	.23	228.59	2.16	-.22	22.0200	.2403	.08	291.	291.	291.
30.000	12.4760	.1359	.22	230.33	2.34	-.70	18.8700	.2293	.27	285.	285.	285.
32.000	9.2933	.1394	-.21	234.96	4.68	.00	13.7800	.2425	.27	73.	76.	73.
34.000	6.9325	.1325	-.12	239.34	5.35	-.14	10.1800	.1717	.19	73.	76.	73.
36.000	5.2836	.1203	-.21	243.36	4.24	.18	7.5630	.1139	-.01	72.	75.	72.
38.000	4.0211	.1051	-.18	248.92	4.30	.18	5.6220	.1107	.03	72.	75.	72.
40.000	3.0774	.0901	-.15	254.39	4.94	.35	4.2130	.0924	-.03	72.	75.	72.
42.000	2.3580	.0768	-.09	253.93	4.51	.20	3.1850	.0324	-.20	72.	75.	72.
44.000	1.8307	.0631	-.01	263.37	4.83	-.50	2.4210	.0810	.00	72.	75.	72.
46.000	1.4216	.0509	.04	267.39	5.41	-.05	1.8510	.0652	.16	72.	73.	72.
48.000	1.1061	.0417	.06	265.44	5.95	.06	1.4340	.0521	.24	71.	68.	71.
50.000	.8624	.0359	.41	268.42	5.57	.42	1.1180	.0425	.50	71.	68.	71.
52.000	.6718	.0293	.48	267.69	5.11	.00	.8729	.0350	-.07	71.	68.	71.
54.000	.5223	.0233	.54	264.98	5.26	-.08	.6837	.0297	.30	70.	72.	70.
56.000	.4051	.0191	.61	261.34	5.33	-.24	.5400	.0241	.55	70.	72.	70.
58.000	.3126	.0150	.65	[illegible]	6.81	.10	[illegible]	[illegible]	.53	65.	68.	65.
60.000	.2399	.0140	.83	251.07	8.25	.18	.3319	.0174	.80	55.	58.	55.
62.000	.1815	.0123	.95	243.71	7.73	-.27	[illegible]	.0154	.47	38.	38.	38.
64.000	.1353	.0108	1.01	235.72	8.70	.00	.2003	.0141	.65	25.	25.	25.
66.000	.1037	.0114	1.20	230.16	14.74	-.14	.1572	.0157	.01	10.	10.	10.

TABLE II-8. THERMODYNAMIC STATISTICAL PARAMETERS

AUGUST

STATION = 61S020 ASCENSION (WIDE AWAKE)

Z KM	MEAN P MB	S.D. P MB	SKEW P	MEAN T DEG K	S.D. T DEG K	SKEW T	MEAN D G/M3	S.D. D G/M3	SKEW D	NOBS P	NOBS T	NOBS D
.000	1010.6000	1.5177	.24	297.90	1.15	-.72	1173.0000	5.3850	.54	330.	330.	390.
.020	1008.3000	1.4635	.26	297.83	1.12	-.75	1171.0000	5.1390	.58	461.	461.	461.
1.000	906.4000	1.3032	.39	293.53	.94	.23	1087.0000	4.0180	-.22	477.	477.	477.
2.000	805.3200	1.2947	.21	2[illegible]3.71	2.80	-.30	975.5000	9.2860	.39	477.	477.	477.
3.000	714.9700	1.3119	-.02	283.08	1.45	-.44	873.0000	4.9580	.10	477.	477.	477.
4.000	633.1700	1.2189	-.03	277.20	1.37	-.37	794.4000	4.4080	.14	477.	477.	477.
5.000	559.4400	1.1645	-.01	272.00	1.32	-.28	715.4000	3.8230	.24	477.	477.	477.
6.000	493.1500	1.1207	-.13	2[illegible]5.40	1.31	-.17	643.9000	3.4180	-.09	477.	477.	477.
7.000	433.3400	1.1177	-.04	258.12	1.28	-.03	579.4000	3.0470	-.28	477.	477.	477.
8.000	379.6100	1.1251	-.04	253.24	1.26	.18	521.4000	2.9670	-.57	476.	476.	476.
9.000	331.2300	1.1159	.04	245.53	1.40	.12	469.3000	2.9320	-.65	474.	474.	474.
10.000	287.7800	1.1303	.16	2[illegible].25	1.37	.47	421.6000	2.5920	-.93	473.	473.	473.
11.000	245.8000	1.1249	.22	229.37	1.39	.64	373.0000	1.9070	-.56	471.	471.	471.
12.000	213.9400	1.0937	.39	221.67	1.35	.61	335.2000	1.5300	.03	471.	471.	471.
13.000	183.2200	1.0502	.44	214.72	1.54	.39	297.8000	1.5060	-.13	471.	471.	471.
14.000	156.0100	1.0168	.44	207.09	1.61	.23	251.4000	1.6030	-.24	470.	470.	470.
15.000	132.2200	.9364	.51	202.02	1.51	.64	227.1000	1.8350	.06	470.	470.	470.
16.000	111.7100	.8475	.53	199.72	1.51	.23	194.9000	1.8790	.18	470.	470.	470.
17.000	94.2710	.7394	.71	193.59	1.79	.29	164.6000	2.0650	.17	467.	467.	467.
18.000	79.6290	.6449	.63	203.14	2.32	.07	136.6000	2.0700	.40	466.	466.	466.
19.000	67.5270	.5378	[illegible]	207.41	2.41	-.32	113.4000	1.6980	.65	464.	464.	464.
20.000	57.4410	[illegible]	.62	211.18	2.24	-.10	94.7700	1.2370	.45	461.	461.	461.
21.000	48.9030	.3610	.51	214.25	2.35	.63	79.6000	.9979	.09	449.	449.	449.
22.000	41.6520	.3460	.41	216.19	2.34	.50	67.4800	.8161	.40	446.	446.	446.
23.000	35.8240	.3090	.28	217.84	2.33	.40	57.2500	.6229	.49	441.	441.	441.
24.000	30.6310	.2876	.18	219.37	2.39	.26	48.7300	.5469	.53	440.	440.	440.
25.000	26.3170	.2655	.09	221.46	2.30	.15	41.4300	.4570	.31	431.	431.	431.
26.000	22.6070	.2422	.09	223.42	2.11	.35	35.2500	.3643	.19	416.	416.	416.
27.000	19.4430	.2220	[illegible]	225.07	2.14	.25	30.1000	.32[illegible]	.09	389.	389.	389.
28.000	16.7390	.1975	.07	[illegible].30	2.[illegible]1	-.03	25.7700	.3119	.05	380.	380.	380.
29.000	14.4240	.17[illegible]1	.09	227.64	2.22	.15	22.0700	.2053	-.05	328.	328.	328.
30.000	12.4510	.1533	.12	229.59	2.24	-.22	18.6900	.2051	-.12	314.	314.	314.
32.000	9.2237	.1461	.15	23[illegible].59	4.00	-.65	13.7100	.2540	.38	72.	74.	72.
34.000	6.9337	.1239	-.02	[illegible].35	3.63	-.32	10.1400	.1441	.03	72.	74.	72.
36.000	5.2399	.1105	-.21	245.15	4.20	-.27	7.5100	.1205	.29	71.	74.	71.
38.000	3.9051	.0955	-.34	248.80	4.02	-.18	5.5790	.1029	.24	71.	74.	71.
40.000	3.0505	.0813	-.40	255.00	4.37	-.30	4.1700	.0916	-.11	71.	74.	71.
42.000	2.3469	.0679	-.42	260.93	4.28	-.02	3.1330	.0835	-.07	71.	73.	71.
44.000	1.8215	.0555	-.45	265.24	4.59	-.18	2.3810	.0694	-.27	71.	71.	71.
46.000	1.4192	.0457	-.49	269.79	3.65	-.29	1.8290	.0528	-.33	71.	65.	71.
48.000	1.1061	.0371	-.47	273.69	4.34	.13	1.4230	.0470	-.44	70.	67.	70.
50.000	.8332	.0297	-.42	2[illegible]9.86	4.68	.39	1.1130	.0365	-.45	70.	66.	70.
52.000	.6722	.0234	-.41	267.29	4.09	.18	.8756	.0313	-.52	67.	68.	67.
54.000	.5223	.0185	-.30	263.91	4.60	-.28	.6939	.0257	-.69	67.	67.	67.
56.000	.4050	.0158	.15	250.07	4.72	-.26	.5423	.0215	.25	66.	67.	66.
58.000	.3119	.0125	.12	[illegible]	6.25	.33	.4[illegible]	.01[illegible]	.00	62.	64.	62.
60.000	.2397	.0100	.23	230.59	7.30	.05	.3320	.0131	-.04	58.	60.	58.
62.000	.1819	.0084	.61	245.25	9.19	-.10	.2583	.0121	1.03	44.	45.	44.
64.000	.1376	.0070	.30	2[illegible].33	9.23	.21	.1993	.0077	.65	20.	21.	20.
66.000	.1049	.0056	-.30	2[illegible].16	16.45	-.27	.1540	.0120	1.13	7.	7.	7.

TABLE II-9. THERMODYNAMIC STATISTICAL PARAMETERS

SEPTEMBER

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	MEAN P MB	S.D. P MB	SKEW P	MEAN T DEG K	S.D. T DEG K	SKEW T	MEAN D G/M3	S.D. D G/M3	SKEW D	NOBS P	NOBS T	NOBS D
.000	1010.3000	1.3025	-.03	297.65	1.17	-.32	1174.0000	5.3930	.18	365.	365.	365.
.020	1007.9000	1.3714	-.04	297.57	1.16	-.32	1171.0000	5.3530	.15	410.	410.	410.
1.000	905.0100	1.2593	-.03	[illegible]	.85	.23	1087.0000	3.5650	-.13	410.	410.	410.
2.000	805.2200	1.1663	-.18	293.09	2.24	-.94	970.9300	7.6030	.92	410.	410.	410.
3.000	715.0500	1.1905	-.25	283.19	1.40	.00	877.8000	4.3510	-.06	410.	410.	410.
4.000	633.2500	1.1069	-.15	278.60	1.25	-.21	795.7000	3.9530	-.09	410.	410.	410.
5.000	[illegible]	1.1112	-.13	271.31	1.27	.01	716.0000	3.0130	-.05	410.	410.	410.
6.000	493.1100	1.0005	-.12	[illegible]	[illegible]	.03	[illegible]	[illegible]	-.22	410.	[illegible]	[illegible]
7.000	433.3300	1.0753	.05	260.20	1.27	.03	579.2000	2.8250	-.58	410.	410.	410.
8.000	379.5200	1.0095	.21	252.23	1.16	.30	521.4000	2.6570	-.62	409.	409.	409.
9.000	331.2000	1.0054	.32	245.52	1.29	.40	469.2000	2.7030	-.78	409.	409.	409.
10.000	287.7400	1.1039	.43	237.43	1.34	.37	421.6000	2.4740	-.82	409.	409.	409.
11.000	248.8800	1.1090	.53	229.51	1.34	.17	377.8000	1.6600	.14	409.	409.	409.
12.000	213.9100	1.0322	.55	221.63	1.31	.04	336.2000	1.4640	.46	410.	410.	410.
13.000	183.1900	1.0425	.59	214.22	1.37	.70	297.9300	1.4170	-.15	409.	409.	409.
14.000	155.9900	.9927	.70	207.81	1.47	.63	261.5000	1.6040	-.41	409.	409.	409.
15.000	132.1900	.9038	.84	202.60	1.23	.32	227.1000	1.6250	-.17	409.	409.	409.
16.000	111.6500	.8169	.77	193.47	1.23	-.22	195.0000	1.7530	.31	410.	410.	410.
17.000	94.2050	.6898	.83	193.02	1.67	-.23	164.9300	2.0370	.58	405.	405.	405.
18.000	79.5160	.5643	.91	202.65	2.44	.35	136.7000	2.0290	.06	402.	402.	402.
19.000	67.4130	.4915	.95	206.97	2.27	-.11	113.5000	1.5520	.50	403.	403.	403.
20.000	57.3230	.4138	.78	210.77	2.45	.29	94.7700	1.2350	.40	400.	400.	400.
21.000	48.8780	.3538	.70	213.78	2.73	.61	79.6500	1.0200	.25	385.	385.	385.
22.000	41.7620	.3449	.70	216.02	2.52	.56	67.3800	.7283	.22	383.	383.	383.
23.000	35.7430	.3227	.74	218.00	2.20	.44	57.1200	.5204	.39	372.	372.	372.
24.000	30.6150	.3046	.74	219.96	2.18	.15	48.4900	.5085	.29	372.	372.	372.
25.000	26.2730	.2009	.74	221.88	2.35	.04	41.2500	.4793	.16	368.	368.	368.
26.000	22.5700	.2458	.67	223.95	2.15	-.09	35.1300	.3375	.14	350.	350.	350.
27.000	19.4170	.2280	.64	225.51	2.09	-.01	30.0000	.3560	.29	317.	317.	317.
28.000	16.7240	.2033	.62	220.03	1.99	-.05	25.6000	.3263	.31	314.	314.	314.
29.000	14.4170	.1735	.65	233.26	2.22	.11	22.0000	.3030	.39	255.	255.	255.
30.000	12.4520	.1546	.53	230.33	2.06	-.24	18.8300	.2556	.47	251.	251.	251.
32.000	9.2765	.1944	-.29	233.24	5.12	.59	13.6700	.2357	-.07	74.	81.	73.
34.000	6.9003	.1691	-.31	241.53	4.34	-.39	10.0290	.2146	.03	73.	80.	73.
36.000	5.3112	.1432	-.26	247.11	5.00	.13	7.4350	.1587	-.13	73.	80.	73.
38.000	4.0506	.1249	-.28	253.53	4.83	-.31	5.5710	.1139	.07	73.	80.	73.
40.000	3.1220	.1050	-.32	259.83	3.98	.07	4.2020	.1150	-.07	73.	80.	73.
42.000	2.4119	.0855	-.28	262.52	4.14	.09	3.2000	.1027	-.38	73.	80.	73.
44.000	1.8719	.0696	-.25	267.48	5.22	.54	2.4380	.0007	-.16	73.	79.	73.
46.000	1.4503	.0573	-.16	270.27	5.50	.07	1.8780	.0556	-.31	73.	74.	73.
43.000	1.1387	.0471	-.03	271.93	5.12	.08	1.4580	.0543	-.40	73.	71.	73.
50.000	.8333	.0335	.11	271.13	4.71	.20	1.1430	.0466	-.40	72.	72.	72.
52.000	.6225	.0283	-.23	269.41	4.55	-.63	.8092	.0335	-.19	71.	76.	71.
54.000	.5363	.0223	-.17	265.16	4.76	-.26	.7062	.0295	-.25	69.	75.	69.
56.000	.4176	.0186	-.04	260.88	5.49	.25	.5560	.0206	-.42	69.	76.	69.
58.000	.3229	.0158	.10	255.94	6.41	-.04	.4378	.0190	-.14	69.	76.	69.
60.000	.2474	.0125	.07	252.19	6.92	-.15	.3419	.0151	.40	66.	72.	66.
62.000	.1878	.0101	.17	247.03	7.14	-.29	.2649	.0125	.60	53.	57.	53.
64.000	.1412	.0072	.01	243.40	8.16	-.28	.2025	.0104	1.14	31.	34.	31.
65.000	.1048	.0055	-.07	233.69	8.85	-1.55	.1554	.0107	1.09	11.	12.	11.

TABLE II-10. THERMODYNAMIC STATISTICAL PARAMETERS

OCTOBER

STATION = 61S020 ASCENSION (WIDE AWAKE)

Z KM	MEAN P MB	S.D. P MB	SKEW P	MEAN T DEG K	S.D. T DEG K	SKEW T	MEAN D G/M3	S.D. D G/M3	SKEW D	NOBS P	NOBS T	NOBS D
.000	1009.1000	1.5166	.00	297.71	1.16	-.15	1172.0000	5.4130	.22	388.	398.	388.
.020	1006.6000	1.5137	-.02	297.57	1.15	-.19	1169.0000	5.3370	.23	427.	427.	427.
1.000	905.0500	1.3011	.15	293.87	.86	.34	1065.0000	3.9730	-.10	433.	433.	433.
2.000	804.6700	1.2103	.11	289.03	1.65	-1.04	956.9000	6.4320	.71	433.	433.	433.
3.000	714.7630	1.1931	-.02	283.63	1.10	-.42	875.9000	3.5720	.10	433.	433.	433.
4.000	633.1100	1.1043	.01	277.19	1.14	.06	794.4000	3.5440	-.38	433.	433.	433.
5.000	559.3700	1.0925	-.03	271.04	1.32	-.04	715.7000	3.0030	-.18	433.	433.	433.
6.000	493.0100	1.0592	-.07	[illegible]	1.30	-.16	644.7000	3.3720	.02	433.	433.	433.
7.000	433.7500	1.0575	-.04	[illegible]	1.28	-.17	[illegible]	[illegible]	-.15	433.	433.	433.
8.000	378.5100	1.0633	.00	253.46	1.24	-.21	521.0000	[illegible]	.07	433.	433.	433.
9.000	331.2000	1.0444	.03	245.92	1.23	-.14	468.6000	2.4030	-.39	432.	432.	432.
10.000	287.8300	1.0937	.01	237.93	1.23	.12	[illegible]	2.0900	-.71	432.	432.	432.
11.000	249.0200	1.0536	.00	229.91	1.23	.43	377.7000	1.5400	-.48	432.	432.	432
12.000	214.0700	1.0540	.10	221.97	1.14	.41	335.0000	1.3200	-.25	431.	431.	431.
13.000	183.3000	.9753	.08	214.31	1.13	.32	298.1000	1.3610	-.10	430.	430.	430.
14.000	156.1100	.9057	.15	207.48	1.27	.23	262.1000	1.5210	-.45	430.	430.	430.
15.000	132.2400	.8302	.21	201.94	1.34	.36	229.1000	1.6900	-.07	429.	429.	429.
16.000	111.6100	.7505	.27	193.45	1.39	-.07	195.9000	1.7450	.32	429.	423.	429.
17.000	94.0610	.6341	.31	197.85	1.06	-.49	165.0000	2.0790	.55	427.	427.	427.
18.000	79.2830	.5360	.32	200.60	2.53	-.11	137.7000	2.1230	.31	427.	427.	427.
19.000	67.1080	.4630	.45	205.30	2.50	-.26	113.9000	1.5310	.25	425.	425.	425.
20.000	57.0050	.4035	.26	209.31	2.62	.34	94.8000	1.1650	.13	421.	421.	421.
21.000	48.5450	.3973	.14	212.36	2.60	.43	79.6000	.9336	.10	406.	406.	406.
22.000	41.4350	.3785	.15	214.83	2.69	.38	67.2000	.7196	.01	404.	404.	404.
23.000	35.4400	.3599	.20	217.07	2.47	.17	56.8000	.5238	.32	396.	396.	396.
24.000	30.3390	.3442	.24	219.45	2.63	.21	48.1600	.4997	.00	395.	395.	395.
25.000	26.0210	.3140	.18	221.56	2.46	-.27	40.9300	.4527	.25	385.	385.	363.
26.000	22.3500	.2830	.19	223.60	2.32	-.15	34.8200	.4037	.24	369.	363.	369.
27.000	19.2180	.2528	.20	225.63	2.26	.09	29.6700	.3378	.07	330.	330.	330.
28.000	16.5510	.2271	.15	227.82	2.26	.03	25.5300	.3557	-.05	326.	326.	326.
29.000	14.2760	.1915	.11	230.03	2.43	.12	21.6400	.3411	.01	274.	274.	274.
30.000	12.3430	.1091	.12	232.12	2.32	.05	18.5300	.2942	.08	208.	259.	268.
32.000	9.2331	.1427	-.03	237.62	3.93	-.32	[illegible]	.1603	-.04	73.	76.	73.
34.000	6.9500	.1225	-.15	242.48	3.94	-.15	[illegible]	.1309	.35	73.	76.	73.
36.000	5.3563	.1203	-.35	248.45	4.14	-.19	7.4420	.1475	-.42	73.	77.	73.
38.000	4.0337	.0923	-.16	253.77	4.27	-.04	5.5910	.1077	.13	73.	77.	73.
40.000	3.1267	.0823	-.25	259.28	4.14	-.61	4.2010	.0926	.00	73.	77.	73.
42.000	2.4190	.0686	-.31	264.53	4.06	-.30	3.1300	.0725	.04	74.	76.	74.
44.000	1.8811	.0574	-.40	268.10	3.47	-.89	2.4320	.0602	.02	74.	70.	74.
46.000	1.4533	.0475	-.40	272.05	3.95	.23	1.8760	.0539	-.23	73.	62.	73.
48.000	1.1478	.0396	-.44	272.91	3.91	-.05	1.4350	.0441	-.68	73.	64.	73.
50.000	[illegible]	.0315	-.35	271.73	3.63	.15	1.1500	.0372	-.53	72.	68.	72.
52.000	.7000	.0251	-.27	[illegible]	3.41	-.05	.9052	.0317	-.55	72.	67.	72.
54.000	.5449	.0204	-.13	263.02	4.39	-.12	.7140	.0233	-.74	71.	73.	71.
56.000	.4215	.0166	-.07	261.72	5.03	-.28	.5612	.0176	-.83	70.	72.	70.
58.000	.3242	.0132	-.05	259.15	6.31	-.26	.4351	.0143	-.47	64.	67.	64.
60.000	.2487	.0110	.02	253.70	6.92	-.43	.3417	.0121	-.22	58.	59.	58.
62.000	.1830	.0083	-.03	246.90	7.19	.33	.2633	.0101	.26	45.	45.	45.
64.000	.1427	.0077	-.01	239.92	5.13	-.43	.2073	.0093	.02	25.	25.	25.
66.000	.1078	.0074	-.25	233.02	9.64	-.75	.1612	.0077	.52	13.	13.	13.

TABLE II-11. THERMODYNAMIC STATISTICAL PARAMETERS

NOVEMBER

STATION = 61902O ASCENSION (WIDE AWAKE)

Z KM	MEAN P MB	S.D. P MB	SKEW P	MEAN T DEG K	S.D. T DEG K	SKEW T	MEAN D G/M3	S.D. D G/M3	SKEW D	NOBS P	NOBS T	NOBS D
.000	1008.0000	1.6294	.05	298.18	1.11	.07	1168.0000	5.5580	.02	405.	405.	405.
.020	1005.6000	1.6028	.08	298.13	1.19	-.05	1165.0000	5.9410	.10	429.	429.	429.
1.000	904.2500	1.3315	.14	293.36	1.10	.79	1002.0000	4.5010	-.46	430.	430.	430.
2.000	804.0400	1.2994	.14	283.54	1.80	-.09	987.6000	6.1830	.74	430.	430.	430.
3.000	714.0500	1.2514	.14	283.30	1.25	-.29	875.0000	3.9030	.05	430.	430.	430.
4.000	632.5200	1.1856	.01	277.68	1.27	-.01	792.2000	3.8030	-.21	430.	430.	430.
5.000	558.9300	1.1276	-.06	272.30	1.32	-.20	714.1000	3.6390	.01	430.	430.	430.
6.000	492.7900	1.1486	.01	266.43	1.40	-.16	643.5000	3.4900	-.03	430.	430.	430.
7.000	433.0100	1.1560	-.01	260.00	1.41	-.01	579.4000	3.1010	-.21	430.	430.	430.
8.000	379.2800	1.1795	-.03	253.19	1.29	-.01	521.2000	2.8790	-.26	430.	430.	430.
9.000	330.9500	1.1798	-.08	245.70	1.37	-.25	468.6000	2.6800	-.45	428.	428.	428.
10.000	287.5500	1.2233	-.12	237.67	1.40	-.39	420.9000	2.4670	-.79	426.	426.	426.
11.000	243.7500	1.2259	-.17	229.68	1.39	-.23	377.3000	1.5100	.02	426.	426.	426.
12.000	213.8300	1.1920	-.11	221.82	1.25	-.02	335.8000	1.2000	.08	425.	425.	425.
13.000	183.1300	1.1300	-.08	214.36	1.27	.23	297.6000	1.4470	-.24	424.	424.	424.
14.000	155.9400	1.0536	.00	207.71	1.27	.10	261.5000	1.5320	-.12	424.	424.	424.
15.000	132.0900	.9451	.09	201.93	1.46	.25	227.8000	1.8000	-.57	423.	423.	423.
16.000	111.4700	.8514	.19	197.83	1.58	-.05	196.2000	2.0040	-.15	421.	421.	421.
17.000	93.8750	.7249	.30	198.58	1.74	-.14	160.4000	2.0280	.13	415.	415.	415.
18.000	79.0320	.6129	.30	202.63	2.45	.15	132.4000	2.0020	.33	412.	412.	412.
19.000	66.7000	.5104	.20	203.52	2.48	.16	114.3000	1.5600	.24	409.	409.	409.
20.000	56.0570	.4572	.15	207.60	2.42	.40	[illegible]	1.2810	.27	408.	408.	408.
21.000	40.1030	.4133	.09	211.10	2.50	.07	73.5100	[illegible]	-.01	393.	393.	393.
22.000	41.0960	.3095	.10	213.87	2.35	.59	66.9100	.7437	.28	392.	392.	392.
23.000	35.1330	.3521	.18	216.41	1.92	.48	56.5600	.5373	.23	387.	387.	387.
24.000	30.0570	.3252	.25	218.70	2.14	-.03	47.6200	.5452	.04	386.	386.	386.
25.000	25.7740	.2693	.23	221.05	2.15	-.04	40.6200	.5187	.14	382.	382.	382.
26.000	22.1360	.2542	.25	223.64	2.07	.05	34.4800	.4624	.17	367.	367.	367.
27.000	19.0400	.2184	.21	226.35	2.37	.33	29.3100	.4290	.13	334.	334.	334.
28.000	16.4140	.1891	.11	229.07	2.50	.30	24.9700	.3742	.07	324.	324.	324.
29.000	14.1790	.1673	.21	231.37	2.52	-.03	21.3500	.3253	.23	266.	266.	266.
30.000	12.2660	.1462	.17	233.49	2.42	.15	18.3000	.2635	.29	263.	263.	263.
32.000	9.2042	.1374	-.16	238.01	3.80	-.08	13.5000	.2045	.23	57.	69.	57.
34.000	6.9466	.1139	.01	242.38	5.07	.27	9.9960	.1930	-.77	57.	69.	57.
36.000	5.2009	.1031	-.15	247.16	5.06	-.12	7.4340	.1462	.13	57.	69.	57.
38.000	4.0265	.0827	-.14	253.45	5.01	-.65	5.5320	.1116	.08	57.	69.	57.
40.000	3.0974	.0737	-.36	260.23	5.90	-.22	4.1520	.0707	.09	57.	69.	57.
42.000	2.3986	.0643	-.50	265.09	5.26	-.42	3.1380	.0672	.24	57.	68.	57.
44.000	1.8688	.0548	-.75	268.48	4.56	-.71	2.4130	.0569	.13	57.	65.	57.
46.000	1.4550	.0455	-.92	271.26	4.29	.05	1.8720	.0337	-.03	57.	60.	57.
49.000	1.1354	.0373	-1.03	271.49	4.82	.39	1.4620	.0410	-.23	57.	68.	57.
50.000	.8864	.0311	-1.01	269.78	5.48	.42	1.1470	.0327	-.84	57.	65.	57.
52.000	.6916	.0278	-.55	267.60	5.73	-.09	.9020	.0307	-.12	58.	68.	58.
54.000	.5387	.0247	-.22	264.90	6.21	-.24	.7053	.0284	.38	59.	68.	59.
56.000	.4163	.0206	-.23	261.04	6.35	-.28	.5578	.0223	.26	56.	65	56.
58.000	.3222	.0175	-.13	257.27	7.41	-.13	.4331	.0217	.35	53.	64.	53.
60.000	.2493	.0130	-.23	254.41	8.31	.24	.3417	.0167	.31	48.	56.	48.
62.000	.1893	.0096	-.40	246.82	8.90	.53	.2681	.0154	.43	31.	38.	31.
64.000	.1430	.0008	-.23	272.13	9.51	1.05	.2031	.0147	-.11	17.	20.	17.
66.000	.1090	.0054	-.75	227.46	9.02	-.35	.1505	.0159	-.27	9.	10.	9.

TABLE II-12. THERMODYNAMIC STATISTICAL PARAMETERS

DECEMBER

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	MEAN P MB	S.D. P MB	SKEW P	MEAN T DEG K	S.D. T DEG K	SKEW T	MEAN D G/M3	S.D. D G/M3	SKEW D	NOBS P	NOBS T	NOBS D
.000	1007.3000	1.6470	-.04	298.66	1.20	.01	1165.0000	5.9010	.11	428.	428.	428.
.020	1005.0000	1.6220	-.06	298.60	1.19	-.02	1163.0000	5.6280	.14	453.	453.	453.
1.000	903.9400	1.4240	-.08	290.09	1.25	.67	1079.0000	5.1940	-.47	453.	453.	453.
2.000	803.9800	1.3349	-.05	288.89	1.83	-.99	966.3000	6.0640	.79	453.	453.	453.
3.000	714.1200	1.3160	-.14	283.49	1.33	-.54	875.4000	4.2190	.25	453.	453.	453.
4.000	632.5800	1.2835	-.17	277.33	1.36	-.03	793.1000	3.2230	-.07	453.	453.	453.
5.000	558.6200	1.2032	-.10	272.10	1.42	-.16	714.7000	4.1600	.07	453.	453.	453.
6.000	492.7500	1.1643	-.06	266.57	1.48	.11	643.0000	3.5670	-.12	453.	453.	453.
7.000	433.0300	1.1851	.01	260.20	1.32	.04	579.1000	2.6800	-.24	452.	452.	452.
8.000	379.3200	1.2193	.14	253.21	1.28	-.15	521.3000	2.5610	-.38	450.	450.	450.
9.000	330.9600	1.1971	-.03	245.65	1.33	-.33	463.9000	2.6100	-.81	448.	448.	448.
10.000	287.5800	1.2136	-.09	237.61	1.34	-.35	421.2000	2.5290	-1.03	448.	448.	448.
11.000	248.7800	1.1949	-.15	229.50	1.35	-.27	377.0000	1.6790	.24	448.	448.	448.
12.000	213.8100	1.1374	-.09	221.65	1.38	-.12	333.0000	1.5270	.49	447.	447.	447.
13.000	183.1000	1.1071	-.07	214.35	1.39	-.11	297.0000	1.5930	-.19	447.	447.	447.
14.000	155.9200	1.0321	.01	207.73	1.53	.39	261.5000	1.6370	-.92	447.	447.	447.
15.000	132.0800	.9638	.19	201.97	1.59	.53	227.0000	2.0280	-.64	446.	446.	446.
16.000	111.4400	.8707	.30	197.56	1.60	.35	196.5000	2.0920	-.22	446.	446.	446.
17.000	93.7940	.7436	.39	193.37	1.99	.04	167.3000	2.2060	.24	439.	439.	439.
18.000	78.8760	.6432	.33	197.19	2.67	.25	139.4000	2.2150	.11	440.	440.	440.
19.000	66.5380	.5555	.29	201.93	2.76	-.09	114.0000	1.6920	.38	439.	439.	439.
20.000	56.4000	.5045	.23	206.47	2.55	-.06	95.1800	1.2030	.35	436.	436.	436.
21.000	47.9410	.4591	.16	210.31	2.42	.46	79.4800	.9404	.25	427.	427.	427.
22.000	40.0630	.4288	.14	213.43	2.26	.40	66.7000	.7712	.40	424.	424.	424.
23.000	34.9140	.3817	.15	215.78	2.05	.55	56.3700	.5298	.24	420.	420.	420.
24.000	29.8590	.3477	.16	217.66	2.12	.11	47.7500	.5704	.12	418.	418.	418.
25.000	25.5330	.3151	.07	220.23	2.25	.14	40.4900	.5382	.06	416.	416.	416.
26.000	21.8750	.2765	.04	223.06	2.22	.31	34.3200	.5215	-.03	407.	407.	407.
27.000	18.8530	.2393	.06	226.60	2.51	.26	29.1600	.4823	-.02	374.	374.	374.
28.000	16.2700	.2033	.0[illegible]	229.65	2.64	.44	24.[illegible]	.4145	.14	367.	367.	357.
29.000	14.0510	.1601	-.02	230.[illegible]	2.71	.39	21.2100	.3409	.25	293.	293.	293.
30.000	12.1500	.1385	-.07	232.61	2.35	.33	18.2100	.2637	.35	285.	285.	285.
32.000	9.0791	.1805	-.34	235.49	3.09	.23	13.4400	.2190	-.36	53.	54.	53.
34.000	6.8348	.1572	-.20	240.29	4.42	-.02	9.9150	.1627	-.02	53.	54.	53.
36.000	5.1724	.1334	-.25	244.70	4.31	.23	7.3330	.1447	.15	53.	54.	53.
38.000	3.9397	.1132	-.32	249.31	5.99	.08	5.5090	.1177	.38	53.	54.	53.
40.000	3.0162	.1044	-.25	253.[illegible]	6.00	.02	4.0530	.0900	-.30	53.	54.	53.
42.000	2.3223	.0903	-.35	262.47	5.37	-.53	3.0910	.0927	.26	53.	54.	53.
44.000	1.6934	.0756	-.49	265.56	4.47	-.55	2.3310	.0835	.20	52.	53.	52.
46.000	1.4033	.0658	-.45	269.12	4.54	-.20	1.8230	.0[illegible]	.03	53.	53.	53.
48.000	1.0978	.0522	-.54	270.01	4.93	.12	1.4170	.0576	-.04	53.	54.	53.
50.000	.8551	.0427	-.53	269.24	5.38	-.05	1.1070	.0500	-.08	52.	52.	52.
52.000	.6809	.0339	-.71	257.08	8.15	.04	.8899	.0438	.10	51.	51.	51.
54.000	.5132	.0273	-.74	263.97	8.33	.16	.6790	.0356	-.41	50.	52.	50.
56.000	.4025	.0218	-.74	263.74	7.44	.31	.5318	.0235	-.70	50.	52.	50.
58.000	.3117	.0175	-.72	[illegible]	7.63	.42	.4[illegible]	.0236	-.60	49.	49.	49.
60.000	.2404	.0125	-.52	257.03	8.91	.48	.3257	.0180	-.21	39.	39.	39.
62.000	.1641	.0094	-.39	253.62	13.01	.35	.2235	.0142	.19	22.	23.	22.
64.000	.1425	.0061	-.37	250.93	13.36	.19	.1972	.0112	.48	14.	13.	13.
66.000	.1074	.0045	-.38	240.38	18.01	.63	.15[illegible]	[illegible]	.19	9.	9.	9.

TABLE II-13. THERMODYNAMIC STATISTICAL PARAMETERS

ANNUAL

STATION = 819020 ASCENSION (WIDE AW...)

Z KM	MEAN P MB	S.D. P MB	SKEW P	MEAN T DEG K	S.D. T DEG K	SKEW T	MEAN D G/M3	S.D. D G/M3	SKEW D	NOBS P	NOBS T	NOBS D
.000	1009.0000	2.2661	.13	299.25	1.66	-.06	1154.0000	9.1040	-.01	4924.	4924.	4924.
.020	1005.7000	2.2373	.10	298.15	1.64	-.07	1161.0000	8.9480	-.02	5393.	5393.	5393.
1.000	904.7000	1.7454	.18	290.55	1.71	.18	1078.0000	7.7370	-.13	5481.	5481.	5481.
2.000	804.5500	1.4043	.10	[illegible]	2.24	-.79	[illegible]	7.8510	.82	5480.	5480.	5480.
3.000	714.5500	[illegible]	.06	[illegible]	[illegible]	-.43	[illegible]	4.4900	.25	5480.	5480.	5480.
4.000	632.9600	1.2495	.01	277.03	1.35	-.12	702.8000	4.1010	.01	5479.	5479.	5479.
5.000	559.3800	1.1935	.02	272.20	1.34	-.24	714.0000	3.0020	.07	5479.	5479.	5479.
6.000	493.1500	1.1327	.04	263.67	1.36	-.13	643.3000	3.4030	-.03	5478.	5478.	5478.
7.000	433.4100	1.1792	.11	[illegible]	1.35	-.11	578.9000	[illegible]	-.16	5476.	5476.	5476.
8.000	379.7100	1.2077	.13	253.60	1.36	-.05	530.0000	2.6780	-.36	5468.	5468.	5468.
9.000	331.4000	1.2191	.14	245.13	1.51	-.03	[illegible]	[illegible]	-.66	5457.	5457.	5457.
10.000	[illegible]	[illegible]	.14	[illegible]	1.54	.00	400.7000	[illegible]	-.85	5449.	5449.	5449.
11.000	249.2400	1.2779	.11	[illegible]	[illegible]	.02	377.4000	1.7410	-.16	5443.	5443.	5443.
12.000	214.3000	[illegible]	.17	[illegible]	1.43	.10	[illegible]	1.4540	.13	5440.	5440.	5440.
13.000	183.5900	1.2025	.19	214.51	1.40	.28	[illegible]	1.5500	-.55	5432.	5432.	5432.
14.000	158.3300	1.1195	[illegible]	207.75	1.45	.39	[illegible]	[illegible]	-.58	5430.	5430.	5430.
15.000	132.4400	1.0071	.35	202.02	1.05	.29	228.4000	2.1720	-.23	5417.	5417.	5417.
16.000	111.7700	[illegible]	.42	[illegible]	1.94	.02	[illegible]	2.2270	.01	5413.	5413.	5413.
17.000	94.1400	[illegible]	.49	[illegible]	2.59	.16	[illegible]	2.0000	.05	5355.	5355.	5355.
18.000	79.2710	.6770	.44	[illegible]	3.64	.11	133.7000	[illegible]	.14	5344.	5344.	5344.
19.000	[illegible]	[illegible]	.37	[illegible]	3.50	.00	[illegible]	[illegible]	.29	5327.	5327.	5327.
20.000	[illegible]	.6012	.18	[illegible]	3.22	.04	[illegible]	[illegible]	.33	5281.	5281.	5261.
21.000	48.3710	.5716	.05	[illegible]	3.00	.24	79.6700	.9781	.30	5123.	5123.	5123.
22.000	41.2050	[illegible]	.03	214.40	2.70	.18	[illegible]	.9171	.24	5098.	5098.	5098.
23.000	35.2240	.4983	-.01	216.75	2.50	.12	56.7100	[illegible]	.18	5021.	5021.	5021.
24.000	30.1990	.4592	-.04	218.90	2.75	.04	[illegible]	.6329	.05	4997.	4997.	4997.
25.000	[illegible]	.4165	-.11	221.23	2.82	-.11	[illegible]	.5156	.04	4929.	4929.	4929.
26.000	[illegible]	.3735	-.19	[illegible]	2.67	-.14	34.5700	[illegible]	.01	4764.	4764.	4764.
27.000	19.1370	[illegible]	[illegible]	[illegible]	2.63	-.04	[illegible]	[illegible]	-.06	4393.	4393.	4393.
28.000	[illegible]	[illegible]	[illegible]	[illegible]	2.57	.00	[illegible]	[illegible]	-.09	4301.	4301.	4301.
29.000	[illegible]	[illegible]	[illegible]	[illegible]	2.59	.02	[illegible]	[illegible]	.00	3545.	3545.	3545.
30.000	[illegible]	.2235	-.34	231.68	2.62	-.18	[illegible]	[illegible]	.04	3467.	3467.	3467.
32.000	[illegible]	[illegible]	-.13	[illegible]	4.29	-.04	[illegible]	[illegible]	.28	827.	875.	826.
34.000	[illegible]	[illegible]	-.12	240.49	[illegible]	.01	[illegible]	[illegible]	.03	[illegible]	874.	826.
36.000	[illegible]	.1431	-.14	[illegible]	5.01	-.02	[illegible]	.1553	-.12	823.	873.	823.
38.000	[illegible]	.1221	[illegible]	[illegible]	[illegible]	-.23	[illegible]	.1270	-.03	821.	871.	821.
40.000	[illegible]	.1043	[illegible]	[illegible]	5.57	-.18	[illegible]	.1143	.02	820.	863.	820.
42.000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-.12	[illegible]	[illegible]	.00	[illegible]	857.	820.
44.000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-.02	818.	830.	[illegible]
46.000	1.4348	[illegible]	-.39	[illegible]	[illegible]	-.01	[illegible]	[illegible]	-.12	815.	[illegible]	[illegible]
48.000	1.1194	[illegible]	[illegible]	[illegible]	5.01	-.02	1.4410	[illegible]	-.31	810.	790.	810.
50.000	[illegible]	[illegible]	-.35	[illegible]	5.16	.21	[illegible]	[illegible]	-.31	803.	[illegible]	803.
52.000	[illegible]	[illegible]	-.35	[illegible]	[illegible]	-.01	[illegible]	.0471	-.36	798.	808.	798.
54.000	.5233	[illegible]	[illegible]	[illegible]	[illegible]	.07	[illegible]	.0325	-.40	790.	826.	790.
56.000	.4102	[illegible]	-.15	[illegible]	6.57	.12	[illegible]	[illegible]	-.40	771.	815.	771.
58.000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.16	[illegible]	[illegible]	[illegible]	[illegible]	775.	[illegible]
60.000	[illegible]	.0127	.14	[illegible]	[illegible]	.21	[illegible]	.0151	-.04	[illegible]	701.	660.
62.000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.0131	[illegible]	[illegible]	510.	482.
64.000	[illegible]	[illegible]	[illegible]	[illegible]	10.19	[illegible]	[illegible]	.0111	.52	[illegible]	292.	275.
66.000	[illegible]	[illegible]	[illegible]	[illegible]	10.37	-.70	[illegible]	[illegible]	[illegible]	115.	122.	115.

TABLE III-1. MOISTURE RELATED STATISTICAL PARAMETERS

JANUARY

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	VAPOR P MEAN MB	S.D. VP MB	SKEW VP	TV MEAN DEG K	TV S.D. DEG K	SKEW TV	DEWPT T MEAN DEG K	S.D. DPT DEG K	SKEW DPT	NOBS T+P	NOBS TV
.000	23.401	2.217	-.09	302.02	1.40	-.13	293.10	1.55	-.34	460.	460.
.020	23.228	2.187	-.10	301.92	1.37	-.14	292.53	1.54	-.37	493.	493.
1.000	15.791	1.970	-.02	293.00	1.31	.31	286.85	1.96	-.43	490.	493.
2.000	7.190	2.004	.23	280.05	1.70	-.56	274.27	6.24	-.55	460.	493.
3.000	4.436	1.713	.21	284.03	1.25	-.52	267.92	5.61	-.57	449.	493.
4.000	2.708	1.170	.28	277.98	1.27	.07	261.29	6.02	-.53	363.	492.
5.000	1.212	.650	1.02	272.42	1.45	-.27	251.41	6.05	.10	330.	492.
6.000	.574	.320	1.43	266.83	1.43	-.07	243.26	5.50	.30	303.	492.
7.000	.313	.170	1.23	260.39	1.47	-.56	237.07	5.23	.18	295.	492.
8.000	.169	.104	1.47	253.39	1.48	-.22	230.87	5.54	.13	299.	493.
9.000	.090	.055	1.10	245.62	1.61	.36	224.97	5.68	-.17	320.	493.
10.000	.043	.024	1.05	237.01	1.68	.62	219.91	5.09	-.45	261.	493.
11.000	.020	.009	1.25	229.05	1.44	.10	213.35	3.35	.02	220.	492.
12.000	.008	.004	1.20	221.95	1.29	.00	207.13	2.93	.12	218.	492.
13.000	.003	.001	.55	214.05	1.33	.44	200.69	3.01	-.56	123.	492.
14.000	.001	.001	.90	209.05	1.58	.50	194.76	3.13	-.35	84.	492.
15.000	.001	.000	.96	202.16	1.89	.42	191.69	1.72	.38	14.	491.
16.000	99.999	99.999	999.99	197.71	2.02	.40	999.99	99.99	999.99	0.	490.
17.000	99.999	99.999	999.99	195.43	2.05	-.03	999.99	99.99	999.99	0.	495.
18.000	99.999	99.999	999.99	196.52	2.00	.42	999.99	99.99	999.99	0.	485.
19.000	99.999	99.999	999.99	200.53	2.67	.29	999.99	99.99	999.99	0.	483.
20.000	99.999	99.999	999.99	205.09	2.58	.09	999.99	99.99	999.99	0.	473.
21.000	99.999	99.999	999.99	209.47	2.43	.26	999.99	99.99	999.99	0.	472.
22.000	99.999	99.999	999.99	212.30	2.28	.27	999.99	99.99	999.99	0.	470.
23.000	99.999	99.999	999.99	214.49	2.07	.32	999.99	99.99	999.99	0.	464.
24.000	99.999	99.999	999.99	216.40	2.35	.18	999.99	99.99	999.99	0.	458.
25.000	99.999	99.999	999.99	218.51	2.53	.21	999.99	99.99	999.99	0.	454.
26.000	99.999	99.999	999.99	221.05	2.61	.06	999.99	99.99	999.99	0.	440.
27.000	99.999	99.999	999.99	223.04	2.62	-.02	999.99	99.99	999.99	0.	414.
28.000	99.999	99.999	999.99	226.07	2.55	-.10	999.99	99.99	999.99	0.	410.
29.000	99.999	99.999	999.99	228.44	2.63	-.10	999.99	99.99	999.99	0.	347.
30.000	99.999	99.999	999.99	230.43	2.58	-.35	999.99	99.99	999.99	0.	333.

TABLE III-2. MOISTURE RELATED STATISTICAL PARAMETERS

FEBRUARY

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	VAPOR P MEAN MB	S.D. VP MB	SKEW VP	TV MEAN DEG K	TV S.D. DEG K	SKEW TV	DEWPT T MEAN DEG K	S.D. DPT DEG K	SKEW DPT	NOBS T+P	NOBS TV
.000	24.535	2.264	-.25	303.10	1.30	-.26	293.87	1.53	-.55	424.	424.
.020	24.395	2.227	-.21	302.98	1.28	-.24	293.78	1.51	-.52	446.	446.
1.000	16.000	2.250	-.19	293.85	1.21	.13	287.03	2.28	-1.01	446.	450.
2.000	7.372	2.879	.49	289.17	1.50	-.27	274.77	5.74	-.29	427.	449.
3.000	4.278	1.654	.15	284.39	1.34	.07	267.35	5.69	-.63	428.	449.
4.000	2.490	1.201	.40	278.05	1.37	.21	259.94	6.55	-.32	374.	449.
5.000	1.130	.626	1.43	272.78	1.43	-.05	250.68	5.81	.33	316.	449.
6.000	.641	.381	2.53	267.22	1.50	-.14	244.41	5.55	.37	293.	448.
7.000	.335	.192	1.57	260.81	1.47	-.11	238.42	5.13	.17	291.	448.
8.000	.187	.100	1.04	253.92	1.44	.00	232.08	5.14	-.06	295.	448.
9.000	.098	.053	.74	246.42	1.50	-.07	226.01	5.30	-.42	314.	448.
10.000	.048	.024	.68	238.45	1.55	-.11	220.10	4.77	-.74	254.	449.
11.000	.023	.009	.93	230.18	1.42	-.25	214.46	3.23	-.29	212.	449.
12.000	.009	.003	.67	222.33	1.44	.30	207.81	2.82	-.36	214.	449.
13.000	.003	.001	.72	214.57	1.50	.73	200.43	3.22	-.43	129.	443.
14.000	.001	.001	.79	207.36	1.63	.52	194.41	3.03	-.40	65.	449.
15.000	.001	.000	-.57	201.93	1.84	.33	189.56	2.86	-.85	10.	448.
16.000	99.999	99.999	999.99	197.55	1.85	.11	999.99	99.99	999.99	0.	448.
17.000	99.999	99.999	999.99	195.33	1.94	.58	999.99	99.99	999.99	0.	445.
18.000	99.999	99.999	999.99	195.50	2.73	.32	999.99	99.99	999.99	0.	442.
19.000	99.999	99.999	999.99	200.78	2.79	.31	999.99	99.99	999.99	0.	441.
20.000	99.999	99.999	999.99	205.14	2.75	.25	999.99	99.99	999.99	0.	440.
21.000	99.999	99.999	999.99	209.07	2.70	.61	999.99	99.99	999.99	0.	441.
22.000	99.999	99.999	999.99	212.14	2.49	.12	999.99	99.99	999.99	0.	439.
23.000	99.999	99.999	999.99	214.52	2.34	.25	999.99	99.99	999.99	0.	431.
24.000	99.999	99.999	999.99	216.55	2.68	.43	999.99	99.99	999.99	0.	423.
25.000	99.999	99.999	999.99	218.63	2.91	.33	999.99	99.99	999.99	0.	397.
26.000	99.999	99.999	999.99	221.51	2.76	.21	999.99	99.99	999.99	0.	385.
27.000	99.999	99.999	999.99	224.13	2.72	.18	999.99	99.99	999.99	0.	348.
28.000	99.999	99.999	999.99	226.61	2.71	.05	999.99	99.99	999.99	0.	329.
29.000	99.999	99.999	999.99	225.30	2.71	.30	999.99	99.99	999.99	0.	290.
30.000	99.999	99.999	999.99	231.11	2.66	.09	999.99	99.99	999.99	0.	275.

TABLE III-3. MOISTURE RELATED STATISTICAL PARAMETERS

MARCH

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	VAPOR P MEAN MB	S.D. VP MB	SKEW VP	TV MEAN DEG K	TV S.D. DEG K	SKEW TV	DEWPT T MEAN DEG K	S.D. DPT DEG K	SKEW DPT	NOBS T+P	NOBS TV
.000	25.708	2.299	.48	303.92	1.18	-.23	294.64	1.46	-.13	466.	468.
.020	25.533	2.267	.47	303.78	1.17	-.25	294.53	1.45	-.14	480.	480.
1.000	16.690	2.300	-.12	294.38	1.01	-.15	287.69	2.20	-.57	479.	480.
2.000	8.364	3.029	.15	289.54	1.44	-.61	276.60	5.81	-.79	466.	480.
3.000	4.894	1.817	.31	284.44	1.18	-.19	269.22	5.53	-.71	448.	460.
4.000	2.739	1.234	.67	278.52	1.17	.06	261.31	6.27	-.35	377.	460.
5.000	1.460	.827	1.40	273.09	1.30	.02	253.47	6.32	.12	341.	480.
6.000	.753	.492	1.33	267.43	1.23	.06	245.85	6.39	.32	303.	480.
7.000	.413	.275	2.05	261.19	1.19	.24	239.67	5.93	.35	301.	480.
8.000	.225	.148	2.17	254.45	1.29	.10	233.47	5.85	.10	289.	480.
9.000	.115	.074	2.02	247.13	1.41	.11	227.18	5.09	-.29	309.	480.
10.000	.058	.034	2.23	239.26	1.44	.17	221.42	5.03	-.40	251.	479.
11.000	.026	.013	2.16	230.95	1.32	.20	215.30	3.70	-.05	225.	479.
12.000	.010	.005	2.08	222.76	1.23	-.10	208.60	3.16	.06	229.	479.
13.000	.004	.002	1.91	214.91	1.26	.27	201.29	3.31	.07	113.	479.
14.000	.001	.001	1.23	207.60	1.40	.18	194.73	3.21	-.18	90.	479.
15.000	99.999	99.999	999.99	201.49	1.58	.13	999.99	99.99	999.99	3.	478.
16.000	99.999	99.999	999.99	197.00	1.58	.14	999.99	99.99	999.99	0.	479.
17.000	99.999	99.999	999.99	194.8[illegible]	1.67	-.17	999.99	99.99	999.99	0.	473.
18.000	99.999	99.999	999.99	195.57	2.84	.38	999.99	99.99	999.99	0.	474.
19.000	99.999	99.999	999.99	201.22	2.66	.08	999.99	99.99	999.99	0.	473.
20.000	99.999	99.999	999.99	205.80	2.46	.15	999.99	99.99	999.99	0.	470.
21.000	99.999	99.999	999.99	209.60	2.23	.18	999.99	99.99	999.99	0.	450.
22.000	99.999	99.999	999.99	213.11	2.14	.21	999.99	99.99	999.99	0.	450.
23.000	99.999	99.999	999.99	215.72	1.96	.33	999.99	99.99	999.99	0.	445.
24.000	99.999	99.999	999.99	218.19	2.32	.25	999.99	99.99	999.99	0.	447.
25.000	99.999	99.999	999.99	220.39	2.56	.11	999.99	99.99	999.99	0.	443.
26.000	99.999	99.999	999.99	222.81	2.50	.04	999.99	99.99	999.99	0.	429.
27.000	99.999	99.999	999.99	225.22	2.47	-.22	999.99	99.99	999.99	0.	396.
28.000	99.999	99.999	999.99	227.75	2.45	-.22	999.99	99.99	999.99	0.	385.
29.000	99.999	99.999	999.99	230.10	2.59	-.33	999.99	99.99	999.99	0.	307.
30.000	99.999	99.999	999.99	232.10	2.44	-.36	999.99	99.99	999.99	0.	300.

TABLE III-4. MOISTURE RELATED STATISTICAL PARAMETERS

APRIL

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	VAPOR P MEAN MB	S.D. VP MB	SKEW VP	TV MEAN DEG K	TV S.D. DEG K	SKEW TV	DEWPT T MEAN DEG K	S.D. DPT DEG K	SKEW DPT	NOBS T+P	NOBS TV
.000	25.800	2.584	-.12	303.98	1.31	-.67	294.68	1.67	-.51	422.	422.
.020	25.613	2.540	-.09	303.97	1.30	-.63	294.56	1.65	-.48	448.	448.
1.000	16.734	2.303	-.20	294.57	1.12	.02	287.72	2.31	-.78	459.	459.
2.000	8.596	3.143	.11	290.05	1.43	.00	275.96	5.83	-.69	433.	459.
3.000	4.792	1.900	.34	284.87	1.22	-.18	268.62	5.81	-.55	330.	459.
4.000	2.513	1.205	.60	279.05	1.20	.37	260.03	6.69	-.23	335.	459.
5.000	1.444	.901	1.31	273.53	1.24	.42	253.07	6.78	.33	297	459.
6.000	.797	.500	1.79	267.75	1.35	.04	245.93	6.44	.32	272.	459.
7.000	.404	.267	1.56	[illegible]	1.35	.22	240.22	6.07	.40	265.	459.
8.000	.215	.149	1.38	[illegible]	1.39	.50	232.93	5.93	.34	267.	457
9.000	.116	.077	1.70	248.93	1.60	.73	227.41	5.32	-.12	273.	457.
10.000	.059	.033	1.55	240.07	1.70	.60	221.53	5.04	-.05	235.	456.
11.000	.026	.012	1.34	231.55	1.35	.76	215.46	3.57	-.25	189.	454.
12.000	.010	.004	.91	223.35	1.14	-.14	208.77	2.74	-.10	213.	455.
13.000	.004	.002	.20	215.34	1.17	.18	201.09	3.17	-.28	118.	455.
14.000	.001	.001	1.04	207.71	1.31	-.05	194.32	2.05	-.34	89.	455.
15.000	99.999	99.999	999.99	201.09	1.44	.17	999.99	99.99	999.99	5.	453.
16.000	99.999	99.999	999.99	195.23	1.51	.23	999.99	99.99	999.99	0.	453.
17.000	99.999	99.999	999.99	194.16	1.70	.32	999.99	99.99	999.99	0.	449.
18.000	99.999	99.999	999.99	196.54	2.72	.10	999.99	99.99	999.99	0.	448.
19.000	99.999	99.999	999.99	201.77	2.74	-.25	999.99	99.99	999.99	0.	445.
20.000	99.999	99.999	999.99	206.49	2.23	-.20	999.99	99.99	999.99	0.	443.
21.000	99.999	99.999	999.99	210.63	2.24	.14	999.99	99.99	999.99	0.	432.
22.000	99.999	99.999	999.99	214.20	2.29	.23	999.99	99.99	999.99	0.	432.
23.000	99.999	99.999	999.99	217.30	2.09	.26	999.99	99.99	999.99	0.	424.
24.000	99.999	99.999	999.99	220.25	2.41	.46	999.99	99.99	999.99	0.	419.
25.000	99.999	99.999	999.99	222.50	2.52	.23	999.99	99.99	999.99	0.	412.
26.000	99.999	99.999	999.99	224.83	2.42	-.04	999.99	99.99	999.99	0.	404.
27.000	99.999	99.999	999.99	225.96	2.47	-.13	999.99	99.99	999.99	0.	373.
28.000	99.999	99.999	999.99	228.25	2.26	-.17	999.99	99.99	999.99	0.	351.
29.000	99.999	99.999	999.99	231.55	2.19	-.10	999.99	99.99	999.99	0.	275.
30.000	99.999	99.999	999.99	233.47	2.04	-.23	999.99	99.99	999.99	0.	263.

TABLE III-5. MOISTURE RELATED STATISTICAL PARAMETERS

MAY

STATION = 619020 ASCENSION (WIDE AWAKE)

Z	VAPOR P MEAN	S.D. VP	SKEW VP	TV MEAN	TV S.D.	SKEW TV	DEWPT T MEAN	S.D. DPT	SKEW DPT	NOBS T+P	NOBS TV
KM	MB	MB		DEG K	DEG K		DEG K	DEG K			
.000	24.216	2.299	-.09	303.28	1.04	-.20	293.65	1.56	-.39	412.	412.
.020	23.919	2.323	-.05	303.16	1.06	-.12	293.45	1.60	-.37	469.	469.
1.000	15.555	2 274	-.05	293.67	1.11	-.05	285.58	2.32	-.62	485.	493.
2.000	7.531	3.345	.25	283.17	1.71	-.31	274.99	6.82	-.45	431.	408.
3.000	3.774	1.648	.20	284.84	1.51	-.09	265.31	6.52	-.12	355.	428.
4.000	1.370	1.032	1.22	279.24	1.40	.04	257.04	6.38	.20	303.	498.
5.000	1.101	.733	2.30	273.55	1.47	.18	250.03	6.23	.67	275.	479.
6.000	.629	.420	2.02	267.76	1.53	.26	243.93	6.02	.65	257.	430.
7.000	.340	.204	2.33	261.66	1.52	.44	237.85	5.24	.42	257.	498.
8.000	.199	.121	1.82	255.20	1.67	.48	232.53	5.26	.30	272.	486.
9.000	.109	.063	1.09	245.00	1.59	.60	226.91	5.43	-.20	295.	486.
10.000	.055	.027	1.17	240.14	1.93	.77	221.34	4.41	-.56	253.	485.
11.000	.026	.011	1.73	231.43	1.36	.91	215.60	3.27	-.05	214.	485.
12.000	.010	.004	1.52	223.26	1.21	.09	208.56	2.64	-.03	233.	495.
13.000	.004	.002	1.19	215.29	1.25	.07	201.53	3.10	-.09	135.	484.
14.000	.001	.001	.55	207.76	1.28	.34	194.58	2.78	-.52	80.	483.
15.000	99.999	99.999	999.99	201.51	1.51	.27	999.99	99.99	999.99	2.	492.
16.000	99.999	99.999	999.99	199.96	1.64	-.06	999.99	99.99	999.99	0.	482.
17.000	99.999	99.999	999.99	195.20	1.81	.28	999.99	99.99	999.99	0.	475.
18.000	99.999	99.999	999.99	199.01	2.60	-.01	999.99	99.99	999.99	0.	475.
19.000	99.999	99.999	999.99	203.79	2.31	-.05	999.99	99.99	999.99	0.	474.
20.000	99.999	99.999	999.99	207.50	2.20	.10	999.99	99.99	999.99	0.	469.
21.000	99.999	99.999	999.99	211.59	2.17	.06	999.99	99.99	999.99	0.	456.
22.000	99.999	99.999	999.99	215.07	2.05	-.06	999.99	99.99	999.99	0.	455.
23.000	99.999	99.999	999.99	217.90	1.84	-.01	999.99	99.99	999.99	0.	449.
24.000	99.999	99.999	999.99	220.57	2.19	.16	999.99	99.99	999.99	0.	448.
25.000	99.999	99.999	999.99	223.29	2.11	.10	999.99	99.99	999.99	0.	448.
26.000	99.999	99.999	999.99	225.65	2.10	.00	999.99	99.99	999.99	0.	431.
27.000	99.999	99.999	999.99	227.39	2.15	.33	999.99	99.99	999.99	0.	401.
28.000	99.999	99.999	999.99	228.42	1.83	.31	999.99	99.99	999.99	0.	395.
29.000	99.999	99.999	999.99	231.08	1.79	.27	999.99	99.99	999.99	0.	335.
30.000	99.999	99.999	999.99	232.56	1.85	-.24	999.99	99.99	999.99	0.	332.

TABLE III-6. MOISTURE RELATED STATISTICAL PARAMETERS

JUNE

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	VAPOR P MEAN MB	S.D. VP MB	SKEW VP	TV MEAN DEG K	TV S.D. DEG K	SKEW TV	DEWPT T MEAN DEG K	S.D. DPT DEG K	SKEW DPT	NOBS T+P	NOBS TV
.000	22.328	2.511	.09	302.03	1.23	-.37	292.32	1.83	-.30	368.	368.
.020	22.018	2.465	.11	301.94	1.20	-.35	292.10	1.81	-.26	426.	426.
1.000	14.093	2.065	.10	292.45	1.14	.09	285.72	2.21	-.40	446.	447.
2.000	7.564	3.164	.13	287.53	2.06	.02	274.04	6.71	-.64	383.	447.
3.000	2.081	1.479	1.91	274.42	1.53	-.10	261.89	5.95	.27	344.	447.
4.000	1.549	.700	2.00	278.47	1.51	.32	254.50	5.34	.23	318.	447.
5.000	.918	.522	2.23	272.70	1.51	.01	246.44	5.38	.02	301.	447.
6.000	.493	.250	1.73	257.00	1.61	-.09	241.99	4.90	.47	283.	447.
7.000	.312	.162	1.33	251.04	1.72	.14	237.18	4.92	.20	293.	447.
8.000	.179	.094	1.10	254.33	1.73	.46	231.73	4.99	-.06	308.	447.
9.000	.099	.051	.83	245.95	1.91	.85	226.24	4.35	-.40	329.	444.
10.000	.051	.020	2.45	239.50	1.96	1.06	220.05	4.55	-.45	279.	444.
11.000	.024	.010	1.71	230.25	1.50	.36	214.97	3.16	-.34	234.	444.
12.000	.010	.003	.79	222.25	1.40	.55	208.23	2.61	-.40	235.	443.
13.000	.004	.002	.64	214.53	1.39	.72	201.76	2.37	-.50	130.	442.
14.000	.001	.001	.73	207.63	1.48	.72	199.33	2.62	-.46	83.	442.
15.000	.001	.000	-.05	202.03	1.61	.34	191.18	1.49	-.38	6.	439.
16.000	99.999	99.999	999.99	198.41	1.75	.27	999.99	99.99	999.99	0.	439.
17.000	99.999	99.999	999.99	197.45	2.05	-.06	999.99	99.99	999.99	0.	434.
18.000	99.999	99.999	999.99	200.35	2.67	-.03	999.99	99.99	999.99	0.	432.
19.000	99.999	99.999	999.99	205.01	2.41	.04	999.99	99.99	999.99	0.	431.
20.000	99.999	99.999	999.99	209.41	2.21	.03	999.99	99.99	999.99	0.	428.
21.000	99.999	99.999	999.99	212.74	2.25	-.04	999.99	99.99	999.99	0.	416.
22.000	99.999	99.999	999.99	215.02	1.93	-.15	999.99	99.99	999.99	0.	412.
23.000	99.999	99.999	999.99	219.04	1.98	-.04	999.99	99.99	999.99	0.	407.
24.000	99.999	99.999	999.99	220.63	2.27	.30	999.99	99.99	999.99	0.	405.
25.000	99.999	99.999	999.99	223.09	2.21	.29	999.99	99.99	999.99	0.	402.
26.000	99.999	99.999	999.99	225.17	2.09	.09	999.99	99.99	999.99	0.	365.
27.000	99.999	99.999	999.99	227.08	2.19	.31	999.99	99.99	999.99	0.	360.
28.000	99.999	99.999	999.99	228.03	1.98	.34	999.99	99.99	999.99	0.	349.
29.000	99.999	99.999	999.99	229.03	2.13	.35	999.99	99.99	999.99	0.	294.
30.000	99.999	99.999	999.99	232.00	2.11	-.16	999.99	99.99	999.99	0.	287.

TABLE III-7. MOISTURE RELATED STATISTICAL PARAMETERS

JULY

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	VAPOR P MEAN MB	S.D. VP MB	SKEW VP	TV MEAN DEG K	TV S.D. DEG K	SKEW TV	DEWPT T MEAN DEG K	S.D. DPT DEG K	SKEW DPT	NOBS T+P	NOBS TV
.000	20.008	2.138	-.03	300.96	1.05	-.36	291.21	1.68	-.42	398.	396.
.020	20.634	2.092	-.01	300.63	1.02	-.41	291.08	1.63	-.39	451.	451.
1.000	13.855	1.945	.24	291.41	1.11	-.01	284.84	2.14	-.13	459.	461.
2.000	8.529	2.919	.17	285.98	2.36	.13	273.79	6.47	-.51	406.	461.
3.000	2.902	1.304	.81	283.51	1.59	-.18	251.70	5.81	-.05	364.	461.
4.000	1.424	.683	1.23	277.89	1.56	-.06	253.61	5.30	.29	322.	451.
5.000	.840	.444	1.76	272.53	1.48	-.28	247.56	5.18	.53	309.	461.
6.000	.506	.292	2.85	[illegible]	1.46	.24	242.00	5.24	.46	302.	461.
7.000	.309	.173	1.72	260.40	1.53	.39	230.91	5.31	.15	304.	460.
8.000	.175	.092	.65	253.34	1.68	.50	231.39	5.34	-.29	322.	459.
9.000	.093	.049	.01	245.66	1.76	.72	225.58	5.32	-.59	347.	458.
10.000	.049	.021	.64	237.55	1.73	.48	220.23	4.35	-1.08	292.	455.
11.000	.022	.008	1.00	229.12	1.41	.04	214.17	3.12	-.42	238.	454.
12.000	.009	.003	.50	221.32	1.27	.03	207.67	2.90	-.56	239.	453.
13.000	.004	.001	.61	213.99	1.38	.17	201.55	2.34	-.23	125.	450.
14.000	.001	.001	1.24	207.64	1.41	-.07	195.53	2.25	.10	69.	450.
15.000	.001	.000	-.40	202.52	1.50	.19	190.05	2.22	-.59	6.	449.
16.000	99.999	99.999	999.99	197.39	1.46	.04	999.99	99.99	999.99	0.	447.
17.000	99.999	99.999	999.99	193.36	1.88	-.02	999.99	99.99	999.99	0.	441.
18.000	99.999	99.999	999.99	202.89	2.37	-.07	999.99	99.99	999.99	0.	441.
19.000	99.999	99.999	999.99	207.03	2.39	.08	999.99	99.99	999.99	0.	440.
20.000	99.999	99.999	999.99	210.93	2.23	.08	999.99	99.99	999.99	0.	430.
21.000	99.999	99.999	999.99	214.01	2.19	.19	999.99	99.99	999.99	0.	416.
22.000	99.999	99.999	999.99	216.20	2.31	.48	999.99	99.99	999.99	0.	411.
23.000	99.999	99.999	999.99	218.23	2.24	.59	999.99	99.99	999.99	0.	405.
24.000	99.999	99.999	999.99	220.02	2.40	.43	999.99	99.99	999.99	0.	406.
25.000	99.999	99.999	999.99	222.19	2.33	.32	999.99	99.99	999.99	0.	391.
26.000	99.999	99.999	999.99	224.29	2.29	.30	999.99	99.99	999.99	0.	381.
27.000	99.999	99.999	999.99	226.19	2.28	.26	999.99	99.99	999.99	0.	357.
28.000	99.999	99.999	999.99	227.49	2.11	.09	999.99	99.99	999.99	0.	350.
29.000	99.999	99.999	999.99	228.59	2.16	-.22	999.99	99.99	999.99	0.	291.
30.000	99.999	99.999	999.99	230.33	2.34	-.70	999.99	99.99	999.99	0.	285.

TABLE III-8. MOISTURE RELATED STATISTICAL PARAMETERS

AUGUST

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	VAPOR P MEAN MB	S.D. VP MB	SKEW VP	TV MEAN DEG K	TV S.D. DEG K	SKEW TV	DEWPT T MEAN DEG K	S.D. DPT DEG K	SKEW DPT	NOBS T+P	NOBS TV
.000	20.010	2.233	-.15	300.15	1.21	-.70	290.57	1.84	-.54	390.	390.
.020	19.843	2.219	-.22	300.07	1.16	-.73	290.44	1.62	-.60	461.	461.
1.000	13.740	1.993	.08	290.62	1.03	.11	284.71	2.18	-.27	475.	477.
2.000	5.928	2.693	.61	287.65	2.71	-.28	271.29	6.90	-.27	406.	477.
3.000	2.905	1.341	1.39	283.70	1.63	-.16	262.23	5.75	-.08	390.	477.
4.000	1.545	.748	.83	277.68	1.52	-.19	254.45	5.69	.03	338.	477.
5.000	.838	.413	1.55	272.43	1.48	-.15	247.65	4.92	.45	319.	477.
6.000	.520	.269	1.16	265.82	1.48	.18	242.37	5.16	.29	322.	477.
7.000	.316	.173	1.51	260.54	1.47	.23	237.18	5.21	.17	328.	477.
8.000	.100	.078	.73	253.68	1.56	.54	231.63	5.40	-.34	335.	476.
9.000	.066	.048	.43	245.30	1.73	.57	225.93	5.20	-.68	353.	474.
10.000	.049	.023	.70	237.09	1.60	.79	220.44	4.30	-.82	290.	473.
11.000	.021	.009	.82	229.33	1.44	1.04	214.03	3.04	-.32	258.	471.
12.000	.009	.003	.44	221.67	1.36	.61	207.44	2.71	-.49	257.	471.
13.000	.003	.001	.29	214.32	1.54	.39	200.82	3.01	-.52	140.	471.
14.000	.001	.001	.44	207.89	1.61	.23	194.80	2.51	-.29	52.	470.
15.000	99.909	99.999	939.99	202.82	1.51	.64	959.99	99.99	959.99	2.	470.
16.000	99.999	99.930	999.99	193.72	1.51	.23	999.99	99.99	999.99	0.	470.
17.000	99.999	99.999	999.99	193.53	1.79	.29	999.99	99.99	999.99	0.	467.
18.000	99.999	99.999	999.99	203.14	2.32	.07	999.99	99.99	999.99	0.	466.
19.000	99.999	99.999	999.99	207.41	2.41	-.32	999.99	99.99	999.99	0.	464.
20.000	99.999	99.939	999.99	211.18	2.24	-.10	993.93	99.99	999.99	0.	461.
21.000	99.999	99.999	999.99	214.25	2.33	.63	959.99	99.99	999.99	0.	449.
22.000	99.959	99.999	999.99	216.19	2.34	.60	939.99	99.99	999.99	0.	446.
23.000	99.939	99.939	999.99	217.84	2.33	.40	999.99	99.99	999.99	0.	441.
24.000	99.939	99.999	999.99	219.37	2.39	.26	999.99	99.99	999.93	0.	440.
25.000	99.999	99.999	999.99	221.46	2.30	.15	999.99	99.99	999.99	0.	431.
26.000	99.999	99.999	999.99	223.42	2.11	.35	999.99	99.99	999.99	0.	416.
27.000	99.999	99.939	999.99	225.07	2.14	.25	999.99	99.99	999.99	0.	389.
28.000	99.999	99.999	999.99	226.30	2.11	-.03	999.99	99.93	933.99	0.	360.
29.000	99.999	99.999	999.99	227.04	2.22	.15	993.99	99.99	909.99	0.	328.
30.000	90.989	99.939	999.99	228.59	2.24	-.22	999.99	99.99	999.99	0.	314.

TABLE III-9. MOISTURE RELATED STATISTICAL PARAMETERS

SEPTEMBER

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	VAPOR P MEAN MB	S.D. VP MB	SKEW VP	TV MEAN DEG K	TV S.D. DEG K	SKEW TV	DEWPT T MEAN DEG K	S.D. DPT DEG K	SKEW DPT	NOBS T+P	NOBS TV
.000	19.890	2.052	-.21	299.69	1.23	-.14	290.49	1.67	-.44	365.	385.
.020	19.754	2.026	-.21	299.79	1.23	-.14	290.38	1.65	-.43	410.	410.
1.000	13.925	1.714	.12	290.43	.92	.19	294.94	1.88	-.22	409.	410.
2.000	5.371	2.436	.63	289.94	2.23	-.87	270.11	6.41	-.23	365.	410.
3.000	3.481	1.304	.47	283.80	1.49	.02	264.72	5.42	-.47	357.	410.
4.000	1.876	.859	.50	277.25	1.34	.01	255.75	5.89	-.30	302.	410.
5.000	.873	.425	1.05	272.19	1.38	.21	248.05	5.11	.33	257.	410.
6.000	.525	.280	1.25	266.83	1.42	.34	242.43	5.21	.39	251.	410.
7.000	.314	.172	1.08	260.65	1.43	.41	237.10	5.24	.24	265.	410.
8.000	.180	.037	.82	253.60	1.41	.63	231.64	5.29	-.05	273.	409.
9.000	.094	.050	.59	245.90	1.60	.66	225.59	5.44	-.54	284.	409.
10.000	.045	.022	.83	237.79	1.65	.68	219.61	4.73	-.86	254.	409.
11.000	.020	.007	.34	229.51	1.35	.24	213.62	2.93	-.42	237.	409.
12.000	.008	.003	.30	221.63	1.31	.04	207.27	2.03	-.41	240.	410.
13.000	.003	.001	.57	214.22	1.37	.70	199.93	3.15	-.31	117.	409.
14.000	.001	.000	.39	207.61	1.47	.63	194.40	2.64	-.35	55.	409.
15.000	99.999	99.999	999.99	202.80	1.29	.32	999.99	99.99	999.99	1.	409.
16.000	99.999	99.999	999.99	199.47	1.23	-.22	999.99	99.99	999.99	0.	410.
17.000	99.999	99.999	999.99	199.02	1.67	-.23	999.99	99.99	999.99	0.	405.
18.000	99.999	99.999	999.99	202.65	2.44	.35	999.99	99.99	999.99	0.	402.
19.000	99.999	99.999	999.99	206.97	2.27	-.11	999.99	99.99	999.99	0.	403.
20.000	99.999	99.999	999.99	210.77	2.45	.29	999.99	99.99	999.99	0.	400.
21.000	99.999	99.999	999.99	213.73	2.73	.61	999.99	99.99	999.99	0.	385.
22.000	99.999	99.999	999.99	216.02	2.52	.56	999.99	99.99	999.99	0.	383.
23.000	99.999	99.999	999.99	218.00	2.20	.44	999.99	99.99	999.99	0.	372.
24.000	99.999	99.999	999.99	219.96	2.18	.15	999.99	99.99	999.99	0.	372.
25.000	99.999	99.999	999.99	221.88	2.35	.04	999.99	99.99	999.99	0.	368.
26.000	99.999	99.999	999.99	223.85	2.15	-.09	999.99	99.99	999.99	0.	350.
27.000	99.999	99.999	999.99	225.51	2.09	-.01	999.99	99.99	999.99	0.	317.
28.000	99.999	99.999	999.99	226.03	1.99	-.05	999.99	99.99	999.99	0.	314.
29.000	99.999	99.999	999.99	228.20	2.22	.11	999.99	99.99	999.99	0.	255.
30.000	99.999	99.999	999.99	230.33	2.06	-.24	999.99	99.99	999.99	0.	251.

TABLE III-10. MOISTURE RELATED STATISTICAL PARAMETERS

OCTOBER

STATION = 61S020 ASCENSION (WIDE AWAKE)

Z KM	VAPOR P MEAN MB	S.D. VP MB	SKEW VP	TV MEAN DEG K	TV S.D. DEG K	SKEW TV	DEWPT T MEAN DEG K	S.D. DPT DEG K	SKEW DPT	NOBS T+P	NOBS TV
.000	20.221	2.008	.01	293.93	1.22	.01	290.76	1.66	-.26	388.	388.
.020	20.097	2.061	.00	289.94	1.20	-.03	290.66	1.64	-.27	427.	427.
1.000	14.532	1.684	-.14	290.64	.95	.30	265.60	1.80	-.43	432.	433.
2.000	5.691	2.195	.30	283.93	1.93	-.80	271.72	5.47	-.42	394.	433.
3.000	3.944	1.571	.08	234.29	1.20	-.16	256.21	5.87	-.61	388.	433.
4.000	2.139	1.025	.43	277.[illegible]	1.19	.35	252.20	6.27	-.24	334.	433.
5.000	.949	.483	1.01	272.20	1.44	.30	249.83	5.54	.15	292.	433.
6.000	.555	.273	1.06	[illegible].59	1.49	.18	242.67	5.23	.22	274.	433.
7.000	.323	.173	1.07	260.57	1.39	.19	237.42	5.16	.25	283.	433.
8.000	.190	.100	1.52	253.78	1.42	.07	232.13	5.24	.10	287.	433.
9.000	.098	.049	.58	246.23	1.44	.22	225.15	4.97	-.48	296.	433.
10.000	.048	.032	.34	233.[illegible]	1.45	.41	220.22	4.59	-.56	256.	432.
11.000	.022	.009	.54	223.91	1.26	.43	214.25	3.22	-.46	223.	432.
12.000	.009	.003	.39	221.97	1.14	.41	207.78	2.84	-.54	225.	432.
13.000	.003	.001	.53	214.31	1.13	.32	200.49	3.19	-.44	120.	431.
14.000	.001	.001	1.08	207.48	1.23	.23	194.18	3.22	-.23	64.	430.
15.000	.001	.0[illegible]0	.10	201.94	1.34	.35	190.18	3.45	-.43	7.	430.
16.000	99.999	99.999	999.99	190.45	1.39	-.07	999.99	99.99	999.99	0.	429.
17.000	99.999	99.999	999.99	197.56	1.86	-.48	999.99	99.99	999.99	0.	429.
18.000	99.999	99.999	999.99	200.60	2.63	-.11	999.99	99.99	999.99	0.	427.
19.000	99.999	99.999	[illegible]	205.30	2.50	-.26	999.99	99.99	999.99	0.	427.
20.000	[illegible]	[illegible]	[illegible]	[illegible].31	2.50	.34	[illegible]	[illegible]	[illegible]	0.	425.
21.000	99.999	99.999	999.99	212.36	2.00	.43	999.99	99.99	999.99	0.	421.
22.000	99.999	99.999	999.99	214.23	2.09	.38	999.99	99.99	999.99	0.	406.
23.000	99.999	99.999	999.99	217.07	2.47	.17	999.99	99.99	999.99	0.	404.
24.000	99.999	99.999	999.99	219.43	2.63	.21	999.99	99.99	999.99	0.	395.
25.000	99.999	99.999	999.99	221.50	2.46	-.27	999.99	99.99	999.99	0.	395.
26.000	99.999	99.999	999.99	223.60	2.32	-.15	999.99	99.99	999.99	0.	365.
27.000	99.999	99.999	999.99	225.60	2.26	.09	999.99	99.99	999.99	0.	369.
28.000	99.999	99.999	999.99	227.62	2.28	.03	999.99	99.99	999.99	0.	330.
29.000	99.999	99.999	999.99	22[illegible]	2.43	.12	999.99	99.99	999.99	0.	326.
30.000	99.999	99.999	999.99	232.12	2.32	.05	999.99	99.99	999.99	0.	268.

TABLE III-11. MOISTURE RELATED STATISTICAL PARAMETERS

NOVEMBER

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	VAPOR P MEAN MB	S.D. VP MB	SKEW VP	TV MEAN DEG K	TV S.D. DEG K	SKEW TV	DEWPT T MEAN DEG K	S.D. DPT DEG K	SKEW DPT	NOBS T+P	NOBS TV
.000	21.037	2.091	-.30	300.55	1.21	.11	291.53	1.62	-.61	405.	405.
.020	20.504	2.122	-.35	300.43	1.28	-.05	291.28	1.65	-.66	429.	429.
1.000	15.008	1.783	-.01	291.19	1.18	.02	286.09	1.84	-.27	429.	430.
2.000	6.518	2.477	.19	288.43	1.62	-.79	273.04	5.85	-.65	406.	430.
3.000	4.044	1.630	.18	283.93	1.29	-.18	266.49	6.02	-.63	381.	430.
4.000	2.005	1.026	.65	278.15	1.34	.20	257.37	6.26	-.03	325.	430.
5.000	1.012	.544	1.81	272.63	1.43	.03	249.53	5.54	.31	302.	430.
6.000	.581	.239	1.10	266.78	1.55	.10	243.52	5.27	.20	294.	430.
7.000	.333	.176	1.02	260.35	1.60	.23	237.73	5.21	.12	293.	430.
8.000	.191	.105	.57	253.02	1.51	.22	232.18	5.33	-.09	300.	430.
9.000	.105	.058	.64	246.02	1.65	.16	226.83	5.34	-.54	315.	428.
10.000	.052	.026	.73	238.00	1.73	.21	220.80	4.83	-.87	274.	426.
11.000	.022	.009	.45	229.68	1.40	-.18	214.20	3.55	-.63	256.	426.
12.000	.009	.004	.76	221.82	1.26	-.02	207.71	3.16	-.49	256.	425.
13.000	.003	.001	.23	214.36	1.27	.23	200.56	3.37	-.60	139.	424.
14.000	.001	.001	.21	207.71	1.27	.10	194.65	3.18	-.59	99.	424.
15.000	.001	.000	-.24	201.95	1.46	.25	189.78	2.33	-.60	8.	423.
16.000	99.999	99.999	999.99	197.88	1.56	-.05	999.99	99.99	999.99	0.	421.
17.000	99.999	99.999	999.99	195.56	1.74	-.14	999.99	99.99	999.99	0.	415.
18.000	99.999	99.999	999.99	198.63	2.45	.15	999.99	99.99	999.99	0.	412.
19.000	99.999	99.999	999.99	203.52	2.49	.16	999.99	99.99	999.99	0.	409.
20.000	99.999	99.999	999.99	207.60	2.42	.40	999.99	99.99	999.99	0.	406.
21.000	99.999	99.999	999.99	211.16	2.50	.87	999.99	99.99	999.99	0.	393.
22.000	99.999	99.999	999.99	213.97	2.35	.59	999.99	99.99	999.99	0.	392.
23.000	99.999	99.999	999.99	215.41	1.92	.48	999.99	99.99	999.99	0.	387.
24.000	99.999	99.999	999.99	218.70	2.14	-.03	999.99	99.99	999.99	0.	386.
25.000	99.999	99.999	999.99	221.05	2.15	-.04	999.99	99.99	999.99	0.	382.
26.000	99.999	99.999	999.99	223.04	2.07	.05	999.99	99.99	999.99	0.	367.
27.000	99.999	99.999	999.99	226.55	2.37	.33	999.99	99.99	999.99	0.	334.
28.000	99.999	99.999	999.99	229.07	2.50	.30	999.99	99.99	999.99	0.	324.
29.000	99.999	99.999	999.99	231.37	2.52	-.03	999.99	99.99	999.99	0.	266.
30.000	99.999	99.999	999.99	233.49	2.42	.15	999.99	99.99	999.99	0.	263.

TABLE III-12. MOISTURE RELATED STATISTICAL PARAMETERS

DECEMBER

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	VAPOR P MEAN MB	S.D. VP MB	SKEW VP	TV MEAN DEG K	TV S.D. DEG K	SKEW TV	DEWPT T MEAN DEG K	S.D. DPT DEG K	SKEW DPT	NOBS T+P	NOBS TV
.000	21.676	2.210	-.19	301.11	1.29	.04	291.[illegible]	1.66	-.43	428.	428.
.020	21.571	2.175	-.16	301.04	1.23	.01	291.79	1.64	-.43	453.	453.
1.000	[illegible]	[illegible]	-.07	[illegible]	1.34	.49	283.34	1.95	-.48	450.	453.
2.000	6.744	[illegible]	.31	[illegible]	1.02	-.91	272.53	5.15	-.47	428.	453.
3.000	4.431	1.622	.24	[illegible]	1.41	-.39	[illegible]	5.32	-.61	431.	453.
4.000	[illegible]	1.101	.44	277.05	1.33	.03	260.72	6.01	-.35	374.	453.
5.000	1.214	[illegible]	1.64	272.49	1.55	.10	251.39	6.13	.13	341.	453.
6.000	[illegible]	.315	1.03	[illegible]	1.59	.18	243.24	5.33	.17	319.	453.
7.000	.237	.178	.73	[illegible]	1.43	.23	237.91	5.15	.02	318.	452.
8.000	.135	[illegible]	.64	[illegible]	1.49	.23	232.48	5.17	-.24	332.	450.
9.000	.101	.051	[illegible]	[illegible]	1.03	.46	[illegible]	5.17	-.59	333.	449.
10.000	[illegible]	.023	.32	237.07	1.70	.67	220.51	4.50	-.31	281.	448.
11.000	[illegible]	.009	.67	223.50	1.36	-.25	214.29	3.23	-.49	255.	448.
12.000	[illegible]	.004	.69	221.65	1.36	-.12	207.79	2.97	-.49	259.	447.
13.000	.004	.002	.71	214.35	1.39	-.11	201.36	3.03	-.48	147.	447.
14.000	.002	.001	.61	207.73	1.50	.33	195.59	2.77	-.64	54.	447.
15.000	.001	.000	.03	201.97	1.69	.53	191.53	1.49	-.16	8.	446.
16.000	99.999	99.999	999.99	[illegible]	1.80	.33	999.99	99.99	999.99	0.	446.
17.000	99.999	99.999	999.99	[illegible]	1.99	.04	999.99	99.99	999.99	0.	430.
18.000	99.999	99.999	999.99	197.19	2.67	.25	999.99	99.99	999.99	0.	440.
19.000	99.999	99.999	999.99	201.59	2.75	-.09	999.99	99.99	999.99	0.	439.
20.000	99.999	99.999	999.99	205.47	2.56	-.06	999.99	99.99	999.99	0.	436.
21.000	99.999	99.999	999.99	210.31	2.42	.46	999.99	99.99	999.99	0.	427.
22.000	99.999	99.999	999.99	213.43	2.26	.40	999.99	99.99	999.99	0.	424.
23.000	99.999	99.999	999.99	215.78	2.05	.55	999.99	99.99	999.99	0.	420.
24.000	99.999	99.999	999.99	217.65	2.12	.11	999.99	99.99	999.99	0.	418.
25.000	99.999	99.999	999.99	[illegible]	2.06	.14	999.99	99.99	999.99	0.	416.
26.000	99.999	99.999	999.99	223.05	2.22	.31	999.99	99.99	999.99	0.	407.
27.000	99.999	99.999	999.99	[illegible]	2.51	.25	999.99	99.99	999.99	0.	374.
28.000	99.999	99.999	999.99	[illegible]	2.64	.44	999.99	99.99	999.99	0.	307.
29.000	99.999	99.999	999.99	230.05	2.71	.39	999.99	99.99	999.99	0.	293.
30.000	99.999	99.999	999.99	232.61	2.35	.33	999.99	99.99	999.99	0.	293.

TABLE III-13. MOISTURE RELATED STATISTICAL PARAMETERS

ANNUAL

STATION = [illegible] ASCENSION (WIDE AWAKE)

Z KM	VAPOR P MEAN MB	S.D. VP MB	SKEW VP	TV MEAN DEG K	TV S.D. DEG K	SKEW TV	DEWPT T MEAN DEG K	S.D. DPT DEG K	SKEW DPT	NOBS T+P	NOBS TV
.000	[illegible]	[illegible]	.15	[illegible]	1.91	.03	[illegible]	2.22	-.20	4924.	4924.
[illegible]	[illegible]	[illegible]	.17	[illegible]	1.69	.03	[illegible]	2.21	-.19	5303.	5393.
1.000	[illegible]	[illegible]	.15	[illegible]	1.66	.16	[illegible]	2.33	-.31	5403.	5481.
2.000	[illegible]	[illegible]	.70	[illegible]	2.22	-.76	273.91	6.43	-.46	5011.	5450.
3.000	[illegible]	[illegible]	.64	[illegible]	1.46	-.24	[illegible]	6.31	-.37	4725.	5480.
4.000	[illegible]	[illegible]	.85	[illegible]	1.47	.07	[illegible]	5.64	-.05	4091.	5479.
5.000	1.000	[illegible]	1.04	[illegible]	1.50	.00	250.09	6.11	.43	[illegible]	5473.
6.000	.575	.301	2.14	[illegible]	1.52	.08	243.53	5.69	.44	3473.	5478.
7.000	[illegible]	[illegible]	[illegible]	[illegible]	1.54	[illegible]	237.70	5.70	.27	[illegible]	[illegible]
8.000	.150	[illegible]	1.04	[illegible]	1.60	.30	[illegible]	5.41	.00	[illegible]	[illegible]
9.000	.101	[illegible]	1.00	[illegible]	1.65	.48	[illegible]	5.42	[illegible]	[illegible]	[illegible]
10.000	[illegible]	[illegible]	[illegible]	[illegible]	1.50	.56	220.47	4.73	[illegible]	3107.	5449.
11.000	.023	.010	1.49	[illegible]	1.59	.25	214.44	3.35	-.25	[illegible]	5443.
12.000	.009	.004	1.15	[illegible]	1.43	.10	207.91	2.87	-.29	2818.	5440.
13.000	[illegible]	.002	.94	[illegible]	1.40	.28	201.01	3.13	-.40	1536.	[illegible]
14.000	[illegible]	.001	.70	[illegible]	1.45	.39	[illegible]	2.93	-.42	951.	5430.
15.000	[illegible]	[illegible]	[illegible]	202.02	1.65	.20	999.99	[illegible]	999.99	72.	5417.
16.000	[illegible]	[illegible]	[illegible]	[illegible]	1.74	.02	[illegible]	[illegible]	[illegible]	0.	5413.
17.000	[illegible]	[illegible]	[illegible]	[illegible]	2.50	.16	[illegible]	[illegible]	[illegible]	0.	[illegible]
18.000	[illegible]	[illegible]	[illegible]	[illegible]	3.04	.11	[illegible]	[illegible]	[illegible]	0.	5344.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.50	.00	[illegible]	[illegible]	[illegible]	0.	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	207.97	3.72	.04	[illegible]	99.99	999.99	0.	5281.
[illegible]	[illegible]	[illegible]	[illegible]	211.54	3.00	.24	999.99	[illegible]	[illegible]	0.	5123.
[illegible]	[illegible]	[illegible]	[illegible]	214.40	2.70	.18	[illegible]	[illegible]	999.99	0.	5073.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2.50	.12	999.99	[illegible]	[illegible]	0.	5021.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2.75	.04	[illegible]	[illegible]	[illegible]	0.	4957.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2.82	-.11	[illegible]	[illegible]	[illegible]	0.	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2.67	-.14	[illegible]	[illegible]	999.99	0.	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2.63	-.04	[illegible]	[illegible]	[illegible]	0.	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2.57	.00	[illegible]	99.99	[illegible]	0.	4301.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2.69	.02	[illegible]	99.90	999.99	0.	3545.
30.000	[illegible]	99.999	[illegible]	231.68	2.62	-.18	999.99	99.99	999.99	0.	3467.

TABLE IV-1. HYDROSTATIC MODEL ATMOSPHERE

JANUARY

STATION = 61S020 ASCENSION (WIDE AWAKE)

Z KM	GEO. HT. KM	P MB	D G/M3	TV DEG K
.000	.000	1008.5000	1161.0000	302.02
.020	.020	1004.3000	1159.0000	301.92
1.000	.997	897.6300	1067.0000	[illegible].00
2.000	1.994	798.6500	9[illegible]3.2000	290.05
3.000	2.991	700.4100	[illegible]8.3000	284.63
4.000	3.987	628.5000	787.7000	277.93
5.000	4.983	555.4900	710.3000	272.42
6.000	5.978	489.0300	630.1000	266.03
7.000	6.974	430.3000	575.6000	260.33
8.000	7.969	377.0300	518.4000	253.39
9.000	8.964	329.0400	466.3000	245.82
10.000	9.959	285.[illegible]	418.7000	237.91
11.000	10.953	247.2600	375.1000	229.05
12.000	11.946	212.7400	333.[illegible]00	221.95
13.000	12.940	182.1100	295.5000	214.68
14.000	13.933	155.1000	259.7000	208.56
15.000	14.926	131.4300	226.5000	202.16
16.000	15.918	110.9500	195.5000	197.71
17.000	16.911	93.3790	165.5000	193.43
18.000	17.903	78.5[illegible]	139.2000	19[illegible].52
19.000	18.894	69.2410	114.8000	20[illegible].90
20.000	19.8[illegible]	58.0700	94.[illegible]	205.69
21.000	20.877	47.6300	79.2300	209.47
22.000	21.867	40.5770	66.5000	212.39
23.000	22.858	34.6260	56.2400	214.49
24.000	23.848	29.5370	47.6500	216.40
25.000	24.837	25.3350	40.3500	218.51
26.000	25.827	21.7030	34.[illegible]	2[illegible]1.05
27.000	26.816	18.[illegible]10	29.0700	[illegible]
28.000	27.805	16.0570	24.7400	2[illegible]8.07
29.000	28.793	13.8400	21.1100	2[illegible]3.44
30.000	29.781	11.9[illegible]03	18.0600	230.49
32.000	31.757	8.9317	13.3500	233.67
34.000	33.731	6.7061	9.9130	235.94
36.000	35.704	5.0584	7.3470	241.15
38.000	37.676	3.8375	5.4510	246.59
40.000	39.646	2.9312	4.0570	253.04
42.000	41.615	2.2561	3.0230	259.85
44.000	43.583	1.7475	2.3050	265.53
46.000	45.550	1.3573	1.7800	267.13
48.000	47.518	1.0566	1.3730	269.38
50.000	49.480	.8234	1.0690	269.84
52.000	51.443	.6423	.8320	270.09
54.000	53.405	.5009	.6517	268.21
56.000	55.366	.3903	.5107	267.66
58.000	57.325	.3034	.4020	263.91
60.000	59.283	.2350	.3174	259.26
62.000	61.240	.1812	.2483	254.93
64.000	63.198	.1391	.1946	250.30
66.000	65.150	.1059	.1547	239.71

TABLE IV-2. HYDROSTATIC MODEL ATMOSPHERE

FEBRUARY

STATION • 619020 ASCENSION (WIDC AAAIE)

Z KM	GEO. HT. KM	P MB	D G/M3	TV DEG K
.000	.000	1006.3000	1157.0000	303.10
.020	.020	1004.0000	1154.0000	302.93
1.000	.997	897.7[illegible]	[illegible]	[illegible]
2.000	1.994	790.0100	[illegible]	[illegible]
3.000	2.991	709.[illegible]	[illegible]	[illegible]
4.000	3.987	628.7[illegible]	787.7000	278.03
5.000	4.983	55[illegible]	70[illegible]	272.78
6.000	5.979	459.[illegible]	639.0000	267.22
7.000	6.974	430.6000	575.3000	260.81
8.000	7.9[illegible]	377.[illegible]	517.[illegible]	253.52
9.000	8.974	320.4500	455.0000	245.42
10.000	9.9[illegible]6	[illegible]	418.4000	[illegible].45
11.000	10.953	247.7300	37[illegible]	[illegible].19
12.000	11.946	213.2100	334.1000	[illegible]
13.000	12.940	1[illegible]2.5800	2[illegible]3.0000	214.67
14.000	13.933	155.4000	260.5000	207.96
15.000	14.926	131.77[illegible]	227.3000	201.03
16.000	15.918	111.1000	195.1000	197.55
17.000	16.911	93.57[illegible]	165.0000	195.[illegible]
18.000	17.903	78.7100	139.5000	196.[illegible]
19.000	18.8[illegible]	[illegible]	115.2000	[illegible]
20.000	19.8[illegible]	55.1[illegible]	95.[illegible]	[illegible]
21.000	20.877	47.[illegible]	79.4000	209.07
22.000	21.867	40.6170	66.7000	212.14
23.000	22.858	34.5600	55.2900	214.52
24.000	23.848	29.6700	47.8000	215.55
25.000	24.937	25.3[illegible]	40.3700	218.03
26.000	25.827	21.7[illegible]	34.2100	221.51
27.000	26.816	18.0[illegible]	29.0000	[illegible].13
28.000	27.6[illegible]	16.09[illegible]0	24.7100	[illegible].24
29.000	28.793	13.5780	21.0000	[illegible].30
30.000	29.781	11.9[illegible]	18.0700	231.11
32.000	31.757	8.5703	13.4000	234.81
34.000	33.731	6.7[illegible]	9.5070	240.35
36.000	35.704	5.[illegible]	7.[illegible]	[illegible]
38.000	37.[illegible]70	3.[illegible]	5.[illegible]	[illegible].07
40.000	39.646	2.9740	4.0040	[illegible].29
42.000	41.515	2.[illegible]	3.0410	[illegible]
44.000	43.583	1.7[illegible]	2.3[illegible]	270.13
46.000	45.550	1.3[illegible]	1.7970	[illegible].49
48.000	47.516	1.0902	1.4050	272.34
50.000	49.480	.8522	1.1020	271.29
52.000	51.443	.6[illegible]	.8[illegible]1	[illegible].58
54.000	53.405	5174	.6915	266.26
56.000	55.366	.4019	.5[illegible]	[illegible].04
58.000	57.325	.3115	.4173	[illegible]31.49
60.000	59.283	.2[illegible]07	.3279	[illegible]37.80
62.000	61.240	.1[illegible]	.2550	[illegible].14
64.000	63.196	.1424	.1974	230.41
66.000	65.150	.1085	.1591	240.51

TABLE IV-3. HYDROSTATIC MODEL ATMOSPHERE

MARCH

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	GEO. HT. KM	P MB	D G/M3	TV DEG K
.000	.000	1006.0000	1153.0000	303.92
.020	.020	1003.7000	1151.0000	303.78
1.000	.997	897.7500	1062.0000	294.58
2.000	1.994	793.9900	960.0000	289.94
3.000	2.991	709.6700	869.1000	284.44
4.000	3.987	628.8400	785.5000	278.52
5.000	4.983	555.6500	703.1000	273.09
6.000	5.979	490.1200	638.4000	267.46
7.000	6.974	430.9500	574.9000	261.19
8.000	7.969	377.7200	517.1000	254.45
9.000	8.964	329.6500	464.9000	247.18
10.000	9.958	286.6500	417.7000	239.26
11.000	10.953	248.2600	374.6000	230.86
12.000	11.946	213.7500	334.3000	222.76
13.000	12.940	183.0400	296.7000	214.91
14.000	13.933	155.6000	261.6000	207.60
15.000	14.926	132.0000	229.3000	201.49
16.000	15.918	111.3100	197.0000	197.00
17.000	16.911	93.6350	167.5000	194.85
18.000	17.903	78.7900	139.6000	196.57
19.000	18.894	66.4500	115.1000	201.22
20.000	19.886	56.2710	93.2500	205.80
21.000	20.877	47.9970	78.4500	209.60
22.000	21.867	40.7330	66.9000	212.11
23.000	22.858	34.7670	58.1300	215.72
24.000	23.848	29.7650	47.5200	218.19
25.000	24.837	25.5120	40.3300	220.39
26.000	25.827	21.9030	34.2000	222.81
27.000	26.816	18.8260	29.1300	225.22
28.000	27.805	16.2260	24.8200	227.75
29.000	28.793	14.0010	21.2000	230.10
30.000	29.781	12.0335	18.1600	232.10
32.000	31.757	9.0649	13.4100	235.53
34.000	33.731	6.8250	9.9290	239.61
36.000	35.704	5.1655	7.3330	244.60
38.000	37.676	3.9379	5.4560	251.60
40.000	39.646	3.0265	4.0620	259.73
42.000	41.615	2.3436	3.0570	266.33
44.000	43.593	1.8244	2.3500	270.61
46.000	45.550	1.4242	1.8240	272.11
49.000	47.516	1.1123	1.4290	271.27
50.000	49.480	.8675	1.1230	269.31
52.000	51.443	.6755	.8835	266.52
54.000	53.405	.5249	.6922	264.28
56.000	55.366	.4068	.5423	261.43
58.000	57.325	.3143	.4252	257.67
60.000	59.283	.2420	.3320	254.07
62.000	61.240	.1856	.2592	249.57
64.000	63.195	.1415	.2026	243.40
66.000	65.150	.1072	.1572	237.53

TABLE IV-4. HYDROSTATIC MODEL ATMOSPHERE

APRIL

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	GEO. HT. KM	P MB	D G/M3	TV DEG K
.000	.000	1006.1000	1153.0000	303.93
.000	.020	1003.7000	1151.0000	303.87
1.000	.997	897.8100	1062.0000	294.57
2.000	1.994	793.0700	950.7000	290.05
3.000	2.991	709.8100	869.0000	294.07
4.000	3.987	629.0900	785.4000	278.05
5.000	4.983	556.2000	708.4000	273.53
6.000	5.979	490.5100	638.0700	267.75
7.000	6.974	431.3700	574.0000	261.66
8.000	7.969	378.2000	516.3000	255.16
9.000	8.964	330.4200	464.1000	249.03
10.000	9.958	287.4800	417.2000	240.07
11.000	10.953	248.9200	374.5000	231.55
12.000	11.946	214.4000	334.4000	223.36
13.000	12.940	183.9700	297.1000	215.34
14.000	13.933	156.4000	262.4000	207.71
15.000	14.925	132.5000	229.0000	201.03
16.000	15.918	111.7000	[illegible]	193.23
17.000	16.911	93.9170	163.5100	194.10
18.000	17.903	79.[illegible]	140.0000	[illegible]
19.000	18.894	66.[illegible]	115.0000	201.77
20.000	19.8[illegible]	56.4000	95.1000	205.49
21.000	20.877	47.9710	79.5400	[illegible]
22.000	21.857	40.[illegible]	[illegible]	214.20
23.000	22.853	34.[illegible]	56.0000	217.[illegible]
24.000	23.848	29.[illegible]	47.[illegible]	[illegible]
25.000	24.837	25.7100	40.0000	[illegible]
26.000	25.827	22.1020	34.0000	[illegible]
27.000	26.816	19.0350	29.2000	[illegible]
28.000	27.805	16.4150	24.9400	[illegible]
29.000	28.793	14.1770	21.3500	231.50
30.000	29.781	12.[illegible]	18.3000	233.47
32.000	31.757	9.2030	13.5100	[illegible]
34.000	33.731	6.9[illegible]	9.9[illegible]	[illegible]
36.000	35.704	5.2[illegible]	7.4130	[illegible]
38.000	37.676	4.0393	5.5[illegible]	253.95
40.000	39.646	3.1073	4.1480	[illegible]
42.000	41.615	2.4024	3.1500	265.42
44.000	43.583	1.8835	2.4120	269.67
46.000	45.550	1.4570	1.8750	270.54
48.000	47.516	1.1704	1.4050	270.03
50.000	49.480	.8257	1.1400	[illegible]
52.000	51.443	.6671	.9022	[illegible]
54.000	53.405	.5340	.7079	262.94
56.000	55.365	.4129	.5644	[illegible]
58.000	57.325	.3193	.4330	256.24
60.000	59.283	.2454	.3303	252.10
62.000	61.240	.1879	.2614	247.14
64.000	63.196	.1420	.2001	241.19
66.000	65.159	.1061	.1533	237.50

TABLE IV-5. HYDROSTATIC MODEL ATMOSPHERE

MAY

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	GEO. HT. KM	P MB	D G/M3	TV DEG K
.000	.000	1007.4000	1157.0000	303.29
.020	.020	1005.2000	1155.0000	303.16
1.000	.997	893.7800	[illegible]	[illegible]
2.000	1.994	[illegible]	[illegible]	[illegible]
3.000	2.991	710.1[illegible]	[illegible]	[illegible]
4.000	3.987	629.4[illegible]00	765.[illegible]	273.[illegible]
5.000	4.983	556.5700	708.7000	[illegible]
6.000	5.979	490.8000	636.5000	267.76
7.000	6.974	431.6400	574.7000	261.65
8.000	7.969	378.4700	516.0000	255.20
9.000	[illegible]	330.6700	464.7000	[illegible]
10.000	9.958	287.6700	417.3000	[illegible]
11.000	10.953	249.0300	374.9000	231.43
12.000	11.946	214.5300	334.7000	223.26
13.000	12.940	183.7800	297.4000	215.29
14.000	13.933	155.5300	262.5000	207.75
15.000	14.926	132.6200	229.2000	201.51
16.000	15.918	111.8700	197.5000	195.96
17.000	16.911	94.1100	167.9000	[illegible]
18.000	17.903	79.3120	137.4000	198.01
19.000	18.894	65.6720	114.0000	202.79
20.000	19.885	55.7130	95.2000	207.50
21.000	20.877	48.2510	79.4[illegible]00	211.39
22.000	21.867	41.1730	66.0100	215.07
23.000	22.859	35.2150	56.3000	217.90
24.000	23.849	30.1810	47.8700	220.57
25.000	24.837	25.9160	40.4300	223.29
26.000	25.827	22.2950	34.4200	[illegible]
27.000	26.816	19.2050	29.4000	227.59
28.000	27.805	16.5[illegible]	25.1500	[illegible]
29.000	28.793	14.3050	21.5700	231.00
30.000	29.781	[illegible]	18.5[illegible]00	[illegible]
32.000	31.757	9.2656	13.6000	238.13
34.000	33.731	7.0104	10.1100	243.19
36.000	35.704	5.3347	7.5140	249.78
38.000	37.676	4.0019	5.5190	254.54
40.000	39.646	3.1416	4.2410	259.54
42.000	41.615	2.4302	3.2200	264.46
44.000	43.583	1.8376	2.4710	267.04
46.000	45.550	1.4397	1.9110	269.45
48.000	47.516	1.1455	1.4390	[illegible]
50.000	49.480	.8928	1.1540	[illegible]
52.000	51.443	.6946	.9157	265.77
54.000	53.405	.5302	.7173	263.35
56.000	55.366	.4172	.5933	253.31
58.000	57.325	.3217	.4417	255.11
60.000	59.283	.2469	.3450	[illegible]
62.000	61.240	.1865	.2694	245.24
64.000	63.196	.1429	.2113	235.96
66.000	65.150	.1063	.1630	221.66

TABLE IV-6. HYDROSTATIC MODEL ATMOSPHERE

JUNI

STATION = 61[illegible]020 ASCENSION (WIDE [illegible])

Z KM	GEO. HT. KM	P MB	D G/M3	TV DEG K
.000	.000	1009.1000	1164.0000	302.03
.020	.020	1006.9000	1162.0000	301.94
1.000	.997	899.[illegible]	1072.0000	[illegible].45
2.000	1.994	800.1700	9[illegible]9.3100	287.[illegible]
3.000	2.991	710.2300	870.1000	28[illegible].42
4.000	3.937	629.4100	7[illegible]7.4[illegible]00	277.47
5.000	4.983	556.3300	710.7000	272.70
6.000	5.979	490.4400	639.9000	267.00
7.000	6.974	431.1700	575.[illegible]000	261.04
8.000	7.969	377.6[illegible]	517.5[illegible]	254.33
9.000	8.964	329.[illegible]00	465.5[illegible]	246.95
10.000	9.[illegible]	285.9100	419.[illegible]	2[illegible]0.80
11.000	10.953	248.2300	375.6000	230.25
12.000	11.946	213.6400	334.9000	222.25
13.000	12.940	182.09[illegible]	295.9000	214.56
14.000	13.933	155.7300	261.3000	207.63
15.000	14.925	131.9700	227.[illegible]	202.03
16.000	15.918	111.4100	195.6000	1[illegible]0.41
17.000	16.911	93.8740	165.5000	197.45
18.000	17.903	79.1630	137.7000	200.35
19.000	18.894	66.9330	113.6[illegible]	205.01
20.000	19.885	56.8630	94.6[illegible]	203.41
21.000	20.877	48.4530	79.3400	21[illegible].74
22.000	21.867	41.3710	66.8400	215.02
23.000	22.859	35.3940	56.5[illegible]00	218.04
24.000	23.848	30.3300	47.8000	220.66
25.000	24.837	26.0480	40.6600	223.09
26.000	25.827	22.4010	34.5[illegible]00	[illegible].17
27.000	26.816	19.2[illegible]	29.[illegible]	227.63
28.000	27.805	16.6370	25.[illegible]	[illegible].58
29.000	28.793	14.3550	21.7[illegible]00	[illegible]
30.000	29.781	12.4034	18.6200	[illegible].00
32.000	31.757	9.3017	13.7[illegible]00	237.14
34.000	33.731	7.0[illegible]02	10.1500	242.14
36.000	35.704	5.3[illegible]78	7.[illegible]	246.33
38.000	37.676	4.0645	5.6590	[illegible]51.35
40.000	39.646	3.1176	4.2600	[illegible].09
42.000	41.615	2.40[illegible]	3.[illegible]	[illegible].14
44.000	43.583	1.85[illegible]	2.[illegible]50	2[illegible].05
46.000	45.550	1.44[illegible]	1.8[illegible]	[illegible].33
48.000	47.516	1.1230	1.4060	267.76
50.000	49.480	.8733	1.1410	267.52
52.000	51.443	.6753	.8[illegible]3	265.81
54.000	53.405	.5273	.7002	253.54
56.000	55.366	.4082	.5[illegible]	259.[illegible]
58.000	57.3[illegible]5	.3146	.47[illegible]	[illegible]
60.000	59.263	.2[illegible]12	.3[illegible]7	[illegible]
62.000	61.240	.18[illegible]	.2[illegible]	24[illegible]
64.000	63.196	.1365	.2070	234.16
65.000	65.150	.1037	.1602	226.41

TABLE IV-7. HYDROSTATIC MODEL ATMOSPHERE

JULY

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	GEO. HT. KM	P MB	D G/M3	TV DEG K
.000	.000	1010.4000	1170.0000	[illegible]
.020	.020	1008.1000	1157.0000	[illegible]
1.000	.537	900.6000	1077.0000	231.41
2.000	1.994	800.5400	972.1000	295.68
3.000	2.991	710.4500	873.0000	293.51
4.000	3.987	629.3200	783.5000	277.03
5.000	4.993	556.1300	710.9000	272.53
6.000	5.379	490.2300	640.0000	266.63
7.000	6.974	430.9000	576.5000	260.40
8.000	7.939	377.4900	519.1000	253.34
9.000	8.934	329.4200	467.1000	245.56
10.000	9.958	286.2100	419.7000	237.55
11.000	10.953	247.4400	376.2000	229.12
12.000	11.946	212.8100	335.0000	221.32
13.000	12.940	182.0000	296.4000	213.59
14.000	13.933	155.0700	260.1700	207.64
15.000	[illegible]	[illegible]	[illegible]	202.72
16.000	15.918	[illegible]	193.9000	193.30
17.000	16.911	93.0400	163.6000	[illegible]
18.000	17.903	79.1200	135.9700	202.53
19.000	18.894	67.0000	112.9000	207.03
20.000	19.885	57.0330	94.2000	210.93
21.000	20.877	48.0000	79.1000	214.01
22.000	[illegible]	[illegible]	[illegible]	[illegible]
23.000	[illegible]	[illegible]	55.7000	[illegible]
24.000	23.840	30.4720	40.2000	[illegible]
25.000	24.637	26.1510	41.0000	[illegible]
26.000	25.827	22.4770	34.9100	224.29
27.000	26.816	19.3450	29.7000	226.19
28.000	27.805	16.6890	25.5300	227.49
29.000	28.793	14.3740	21.9100	228.59
30.000	29.781	12.4078	18.7700	230.33
32.000	31.757	9.2938	13.7600	234.96
34.000	33.731	6.2053	10.1000	238.34
36.000	35.704	5.2832	7.5720	243.35
38.000	37.676	4.0162	5.6300	248.92
40.000	39.646	3.0753	4.2160	254.33
42.000	41.615	2.3563	3.1870	258.93
44.000	43.583	1.8292	2.4220	263.37
46.000	45.550	1.4200	1.6520	267.39
48.000	47.516	1.1052	1.4350	268.44
50.000	49.480	.8608	1.1100	250.42
52.000	51.443	.6702	.8732	267.63
54.000	53.405	.5211	.6900	264.98
56.000	55.366	.4040	.5391	261.34
58.000	57.325	.3120	.4237	256.64
60.000	59.283	.2399	.3320	251.97
62.000	61.240	.1832	.2521	243.71
64.000	63.193	.1380	.2054	235.32
66.000	65.150	.1040	.1576	230.16

TABLE IV-8. HYDROSTATIC MODEL ATMOSPHERE

AUGUST

STATION = 81S020 ASCENSION (WIDE AWAKE)

Z KM	GEO. HT. KM	P MB	D G/M3	TV DEG K
.000	.000	1010.6000	1173.0000	300.15
.020	.020	1003.3000	1171.[illegible]	[illegible].07
1.000	.997	900.5[illegible]	1070.0000	2[illegible].02
2.000	1.994	800.4000	983.4000	2[illegible].63
3.000	2.991	710.5400	872.5000	2[illegible]7.70
4.000	3.987	629.4000	789.6000	27[illegible].60
5.000	4.983	556.1600	711.[illegible]00	272.43
6.000	5.973	490.2400	640.1000	2[illegible].02
7.000	6.974	430.[illegible]	575.8000	2[illegible]
8.000	7.959	377.5500	518.8000	[illegible]
9.000	8.964	329.5200	466.8000	243.90
10.000	9.953	288.3300	419.7000	237.59
11.000	10.953	247.5300	376.9000	223.33
12.000	11.945	212.9700	334.7000	221.67
13.000	12.940	182.2700	296.3000	214.32
14.000	13.933	155.2100	260.1000	207.[illegible]
15.000	14.925	131.5[illegible]	229.0000	[illegible]2.[illegible]
16.000	15.918	111.1700	193.9000	19[illegible].72
17.000	16.911	95.8145	163.0000	1[illegible].50
18.000	17.903	79.[illegible]	138.0000	205.14
19.000	18.894	67.2[illegible]20	112.9[illegible]00	207.41
20.000	19.886	57.1750	94.3700	211.18
21.000	20.877	48.7[illegible]0	79.2000	214.05
22.000	21.867	41.[illegible]	67.1000	216.10
23.000	22.858	35.0340	57.0[illegible]00	217.04
24.000	2[illegible]	30.5[illegible]	48.8000	2[illegible].57
25.000	24.837	26.1[illegible]	41.2100	2[illegible].40
26.000	25.827	22.5[illegible]	35.0[illegible]0	2[illegible]3.42
27.000	26.816	18.3570	29.9000	225.07
28.000	27.805	16.6660	25.6300	226.30
29.000	28.793	14.3020	21.9300	227.64
30.000	29.781	12.3907	18.8000	2[illegible].59
32.000	31.757	9.26[illegible]	13.7100	234.53
34.000	33.731	6.9[illegible]	10.1400	2[illegible].73
36.000	35.704	5.23[illegible]	7.5100	243.15
38.000	37.676	4.0032	5.5020	240.60
40.000	39.646	3.0645	4.1720	255.00
42.000	41.615	2.3612	3.1410	260.95
44.000	43.583	1.8256	2.3050	265.24
46.000	45.550	1.4239	1.8320	269.79
48.000	47.516	1.1105	1.4240	270.[illegible]
50.000	49.480	.8004	1.1140	2[illegible].65
52.000	51.443	.6700	.8785	267.25
54.000	53.405	.5244	.6908	263.91
56.000	55.356	.4051	.5420	260.07
58.000	57.325	.3133	.4254	2[illegible].53
60.000	59.283	.2405	.3331	250.53
62.000	61.240	.1837	.2599	245.25
64.000	63.196	.1394	.2010	2[illegible].73
66.000	65.150	.1055	.1537	239.16

TABLE IV-9. HYDROSTATIC MODEL ATMOSPHERE

SEPTEMBER

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	GEO. HT. KM	P MB	D G/M3	TV DEG K
.000	.000	1010.3000	1174.0000	299.83
.020	.020	1008.0000	1171.0000	299.79
1.000	.997	900.1700	1080.0000	293.43
2.000	1.994	800.3200	954.5000	288.94
3.000	2.991	710.6100	872.3000	283.90
4.000	3.987	623.4100	790.3000	277.35
5.000	4.983	556.0000	711.7000	272.19
6.000	5.978	490.1000	639.5000	265.83
7.000	6.974	430.6000	575.9000	260.05
8.000	7.969	377.5000	518.0000	253.00
9.000	8.954	329.4700	468.0000	245.30
10.000	9.939	285.3000	419.4000	237.73
11.000	10.953	247.5000	375.8000	229.51
12.000	11.946	212.9700	334.0000	221.63
13.000	12.940	182.2000	295.4000	214.22
14.000	13.933	155.1600	260.1000	207.81
15.000	14.926	131.5500	226.0000	202.20
16.000	15.918	111.1400	194.1000	199.47
17.000	16.911	93.7540	164.1000	193.02
18.000	17.903	79.1370	136.1000	202.65
19.000	18.894	67.1240	113.0000	206.37
20.000	19.886	57.0770	94.3400	210.77
21.000	20.877	48.6520	79.3000	213.78
22.000	21.867	41.5710	67.0400	215.02
23.000	22.858	35.5700	56.8400	218.00
24.000	23.848	30.4760	48.2700	219.95
25.000	24.837	26.1540	41.0600	221.89
26.000	25.827	22.4730	34.9700	223.85
27.000	26.816	19.3350	29.9700	225.51
28.000	27.805	16.6330	25.5700	228.83
29.000	28.793	14.3560	21.9100	229.26
30.000	29.781	12.3310	18.7400	230.33
32.000	31.757	9.2776	13.6900	235.24
34.000	33.731	6.9958	10.0000	241.53
36.000	35.704	5.3092	7.4340	247.11
38.000	37.676	4.0565	5.5730	253.53
40.000	39.646	3.1190	4.2010	258.63
42.000	41.615	2.4004	3.1970	262.52
44.000	43.583	1.8695	2.4340	267.48
46.000	45.550	1.4361	1.8770	270.27
48.000	47.516	1.1266	1.4560	271.93
50.000	49.480	.8970	1.1400	271.19
52.000	51.443	.6924	.8993	268.41
54.000	53.405	.5398	.7075	265.16
56.000	55.365	.4175	.5574	260.93
58.000	57.325	.3224	.4370	255.94
60.000	59.283	.2479	.3424	252.19
62.000	61.240	.1806	.2674	247.05
64.000	63.196	.1444	.2067	243.40
66.000	65.150	.1093	.1615	235.68

TABLE IV-10. HYDROSTATIC MODEL ATMOSPHERE

OCTOBER

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	GEO. HT. KM	P MB	D G/M3	TV DEG K
.000	.000	1009.1000	1172.0000	299.93
.020	.020	1006.8000	1169.0000	299.94
1.000	.997	899.1000	1078.0000	290.64
2.000	1.994	793.0000	980.0000	[illegible]
3.000	2.991	710.2000	873.3000	[illegible]
4.000	3.987	623.1700	785.4000	277.55
5.000	4.983	555.0000	711.0000	272.20
6.000	5.979	489.9000	640.3000	265.58
7.000	6.974	430.5700	575.0000	260.57
8.000	7.963	377.3500	518.0000	253.78
9.000	8.964	330.3000	466.0000	245.25
10.000	9.958	286.2000	413.0000	239.23
11.000	10.953	247.0300	375.[illegible]	233.51
12.000	11.945	213.0300	[illegible]	221.37
13.000	12.940	182.3000	[illegible]	214.31
14.000	13.933	155.2700	260.7000	207.43
15.000	14.926	131.5600	227.0000	201.94
16.000	15.918	111.0500	194.0000	199.45
17.000	16.911	93.5680	165.0000	197.55
18.000	17.903	78.9400	137.1000	200.60
19.000	18.894	66.8040	113.4000	205.30
20.000	19.885	56.7260	94.4300	209.31
21.000	20.877	48.3190	79.2700	212.70
22.000	21.867	41.2380	65.3700	214.83
23.000	22.858	35.2560	56.5300	217.07
24.000	23.848	30.1990	47.9400	219.45
25.000	24.837	25.9030	40.7400	221.50
26.000	25.827	22.2530	34.8700	223.00
27.000	26.818	19.1450	29.5[illegible]	[illegible]
28.000	27.805	16.4550	25.[illegible]	227.72
29.000	28.793	14.2320	21.5700	[illegible]
30.000	29.781	12.2973	18.4500	232.12
32.000	31.757	9.2032	13.5400	236.23
34.000	33.731	6.8715	10.0990	242.48
36.000	35.704	5.2376	7.4590	248.45
38.000	37.678	4.0510	5.5310	253.77
40.000	39.646	3.1162	4.2010	258.28
42.000	41.615	2.4103	3.1910	[illegible]
44.000	43.5[illegible]	1.8743	2.4350	269.10
46.000	45.550	1.4621	1.8790	272.03
48.000	47.516	1.1427	1.4640	272.91
50.000	49.400	.8931	1.1489	271.73
52.000	51.443	.6889	.9057	268.53
54.000	53.405	.5425	.7128	265.02
56.000	55.366	.4209	.5621	261.72
58.000	57.329	.3253	.4405	258.15
60.000	59.283	.2505	.3451	253.70
62.000	61.240	.1918	.2714	245.93
64.000	63.195	.1459	.2123	239.92
66.000	65.150	.1099	.1648	233.58

TABLE IV-11. HYDROSTATIC MODEL ATMOSPHERE

NOVEMBER

STATION = 619020 ASCENSION (WIDE AWAKE)

Z KM	GEO. HT. KM	P MB	D G/M3	TV DEG K
.000	.000	100[illegible].0000	1168.0000	300.05
.020	.020	1005.7000	1166.0000	300.49
1.000	.997	89[illegible].3700	1075.0000	291.19
2.000	1.994	799.9300	991.4000	28[illegible].48
3.000	2.991	709.4700	870.0000	28[illegible].93
4.000	3.987	628.0000	787.5000	270.15
5.000	4.983	553.5100	703.7000	27[illegible].69
6.000	5.979	493.6[illegible]	634.4000	[illegible]
7.000	6.974	430.4000	575.5000	[illegible]
8.000	7.969	377.0700	518.1000	[illegible]
9.000	8.964	329.1100	468.0000	245.02
10.000	9.958	285.0000	418.0000	2[illegible].60
11.000	10.953	247.3400	375.1000	22[illegible].33
12.000	11.946	212.8000	334.2000	221.02
13.000	12.940	1[illegible]2.1300	29[illegible].0000	214.35
14.000	13.933	155.0800	230.1000	207.71
15.000	14.926	131.4200	226.7000	201.95
16.000	15.918	110.9100	193.3070	137.03
17.000	16.911	93.4000	165.5000	1[illegible]3.58
18.000	17.903	78.6910	137.0000	1[illegible]0.03
19.000	18.894	65.4800	113.0000	203.32
20.000	19.886	56.[illegible]970	94.5[illegible]00	207.60
21.000	20.877	47.9770	78.1500	211.18
22.000	21.857	40.9150	6[illegible].0000	213.97
23.000	2[illegible].833	34.[illegible]	59.[illegible]	21[illegible]
24.000	23.848	29.9260	47.0700	21[illegible].70
25.000	24.837	25.0880	40.4400	221.05
26.000	25.827	22.0430	34.3400	[illegible]
27.000	26.816	18.9600	28.1900	22[illegible].35
28.000	27.805	16.3540	24.8700	229.07
29.000	28.793	14.1230	21.2600	231.37
30.000	29.781	12.2141	18.2200	233.43
32.000	31.757	9.1723	13.4700	233.01
34.000	33.731	6.9275	9.9330	2[illegible]2.38
36.000	35.704	5.2500	7.4400	247.16
38.000	37.676	4.0188	5.5[illegible]40	253.45
40.000	39.648	3.0925	4.1540	260.29
42.000	41.615	2.3951	3.1470	263.09
44.000	43.583	1.8833	2.4170	269.48
46.000	45.550	1.4533	1.8730	271.26
48.000	47.516	1.1347	1.4610	271.48
50.000	49.480	.8825	1.1470	267.72
52.000	51.443	.6[illegible]	.9013	[illegible]
54.000	53.405	.5304	.7078	264.90
56.000	55.365	.4159	.5503	261.04
58.000	57.325	.3211	.4032	257.33
60.000	59.283	.2473	.3300	254.41
62 000	61.240	.1894	.2582	246.02
64.000	63.196	.1439	.2103	233.16
66.000	65.150	.1091	.1660	227.48

TABLE IV-12. HYDROSTATIC MODEL ATMOSPHERE

DECEMBER

STATION = 618020 ASCENSION [illegible]

Z KM	GEO. HT. KM	P MB	D G/M3	TV DEG K
.000	.000	1007.7[illegible]	1165.[illegible]	[illegible]
[illegible]	.000	[illegible]	1104.[illegible]	[illegible]
1.000	.997	[illegible]	1074.[illegible]	[illegible]
2.000	1.934	7[illegible]	9[illegible]	[illegible]
3.000	2.921	70[illegible]	[illegible]	[illegible].21
4.000	3.937	[illegible]	73[illegible]	277.8[illegible]
5.000	4.[illegible]3	[illegible]	7[illegible]	27[illegible]
6.000	5.[illegible]	4[illegible]	[illegible]	[illegible]
7.000	6.374	43[illegible]	575.[illegible]	[illegible]
8.000	7.[illegible]	377.[illegible]	51[illegible]	[illegible]
9.000	8.[illegible]	3[illegible]	480.2000	2[illegible]
10.000	9.[illegible]	2[illegible].5[illegible]	419.8000	237.87
11.000	10.933	24[illegible]	375.4900	229.50
12.000	11.9[illegible]6	213.7[illegible]	33[illegible]	221.55
13.000	12.[illegible]0	182.0[illegible]	295.[illegible]	214.[illegible]
14.000	13.933	155.0000	[illegible]	207.7[illegible]
15.000	14.[illegible]	131.3[illegible]	2[illegible]	201.97
16.000	15.919	11[illegible]	1[illegible]	197.[illegible]
17.000	16.911	93.[illegible]	1[illegible]	1[illegible].37
18.000	17.[illegible]	78.[illegible]	130.7[illegible]	1[illegible].19
19.000	18.[illegible]	[illegible]	114.[illegible]	201.[illegible]
20.000	19.[illegible]	56.1[illegible]	9[illegible]	[illegible].47
21.000	20.377	47.7[illegible]	7[illegible]	210.31
22.000	21.867	40.[illegible]	65.3700	213.43
23.000	2[illegible]	34.7310	56.07[illegible]	215.79
24.000	[illegible]	2[illegible].7140	47.[illegible]	217.[illegible]
25.000	24.837	25.[illegible]	40.[illegible]	220.2[illegible]
26.000	25.[illegible]27	21.0000	34.1400	2[illegible]3.05
27.000	26.016	18.[illegible]	29.0000	[illegible].30
28.000	27.8[illegible]	16.2000	24.8000	[illegible].56
29.000	2[illegible].793	13.9[illegible]	21.1100	2[illegible].53
30.000	29.791	12.0[illegible]7	18.12[illegible]	23[illegible].61
32.000	31.757	9.[illegible]3	13.4[illegible]	2[illegible].49
34.000	33.[illegible]	6.[illegible]1	[illegible]	[illegible]
36.000	[illegible]	5.1[illegible]	7.[illegible]	[illegible]
38.000	37.675	3.9308	5.5110	2[illegible]3.31
40.000	39.646	3.0173	4.1[illegible]	2[illegible].38
42.000	41.615	2.3[illegible]	3.09[illegible]0	2[illegible].47
44.000	43.593	1.8[illegible]	2.[illegible]0	2[illegible].55
46.000	45.[illegible]0	1.4052	1.[illegible]	2[illegible].12
48.000	47.[illegible]16	1.0[illegible]3	1.4[illegible]	270.91
50.000	49.430	.[illegible]	1.1[illegible]	[illegible].[illegible]
52.000	51.[illegible]	.[illegible]	.[illegible]3	[illegible].05
54.000	53.405	.517[illegible]	.[illegible]	[illegible].[illegible]7
56.000	5[illegible]	.[illegible]1[illegible]	.5[illegible]13	[illegible].74
58.000	57.325	.3111	.41[illegible]	[illegible].73
60.000	59.293	.2403	.3[illegible]	2[illegible]7.03
62.000	61.240	.1[illegible]3	.2[illegible]44	[illegible].03
64.000	63.1[illegible]	.1419	.1373	[illegible].33
66.000	[illegible].150	.1[illegible]	.1[illegible]70	240.38

TABLE IV-13. HYDROSTATIC MODEL ATMOSPHERE

ANNUAL

STATION = 616020 ASUNCION [illegible]

Z KM	GEO. HT. KM	P MB	D [illegible]	TV [illegible]
.000	.000	1000.0000	1194.[illegible]	[illegible]
.030	.030	1005.7000	1161.0000	301.07
1.000	.927	908.[illegible]	1071.0000	[illegible]
2.000	1.924	793.4000	953.7000	283.14
3.000	2.931	703.9000	870.0000	281.26
4.000	3.987	679.[illegible]	787.6000	278.10
5.000	4.963	563.9100	710.1000	272.73
6.000	5.973	[illegible]	[illegible]	267.[illegible]
7.000	6.974	450.6000	575.[illegible]	260.[illegible]
8.000	7.969	377.[illegible]	517.[illegible]	254.00
9.000	8.984	300.[illegible]	455.0000	245.52
10.000	9.950	265.5100	418.5000	273.50
11.000	10.933	247.6000	375.3000	230.10
12.000	11.916	213.2000	334.4000	222.18
13.000	12.940	182.6000	285.4000	214.61
14.000	13.933	155.5000	250.7000	207.75
15.000	14.925	131.7700	227.2000	[illegible]
16.000	15.918	111.2000	195.7000	1[illegible].01
17.000	16.911	93.0000	165.0000	[illegible]
18.000	17.903	78.[illegible]	138.1000	1[illegible]9.10
19.000	18.894	65.7600	114.1000	203.67
20.000	19.8[illegible]	56.2440	94.7600	207.97
21.000	20.877	48.1500	79.[illegible]	211.54
22.000	21.857	41.0790	66.7450	214.40
23.000	22.8[illegible]	35.1[illegible]	56.[illegible]	216.70
24.000	23.849	30.[illegible]	47.[illegible]	218.[illegible]
25.000	24.837	25.7700	40.5000	221.23
26.000	25.827	22.1440	34.5100	223.95
27.000	25.016	19.0520	29.4000	225.76
28.000	27.805	16.4150	25.1000	227.83
29.000	28.793	14.1630	21.4000	229.73
30.000	29.781	12.2354	18.4000	231.59
32.000	31.757	9.1672	13.5000	236.13
34.000	33.731	6.9093	10.0300	240.49
36.000	35.704	5.2348	7.4400	245.42
38.000	37.676	3.9914	5.5410	251.03
40.000	39.646	3.0639	4.1520	257.63
42.000	41.615	2.3088	3.1320	263.29
44.000	43.583	1.8370	2.3370	267.57
46.000	45.550	1.4306	1.8510	269.91
48.000	47.516	1.1157	1.4400	270.46
50.000	49.480	.8703	1.1270	269.65
52.000	51.443	.6790	.8[illegible]	267.[illegible]
54.000	53.403	.5271	.6[illegible]45	2[illegible].93
56.000	55.365	.4037	.5453	261.50
58.000	57.325	.3159	.4278	257.79
60.000	59.283	.2431	.3300	253.37
62.000	61.240	.1862	.2620	249.12
64.000	63.196	.1418	.2042	242.49
66.000	65.150	.1072	.1520	234.93

APPENDIX A

EXAMPLES OF WIND STATISTICS FOR ASCENSION ISLAND, SOUTH ATLANTIC

Appendix A gives some examples of graphical displays of wind statistics that can be derived from the statistical parameters presented in table I. These illustrations should aid the user of the RRA to understand the functional relationships of the probability wind models and, thus, to develop an appreciation of the powerful properties of the bivariate normal probability distribution function.

All illustrations for this appendix are derived from the five wind component statistical parameters from table I.1 for January and table I.7 for July for eight selected altitudes. These selected altitudes are 4, 12, 20, 30, 40, 50, 60, and 66 km.

1. Frequency of Wind Direction (Figures A-1 through A-16)

The derived frequencies for wind direction shown in figures A-1 through A-16 were obtained using the five wind component parameters from tables I.1 and I.7 as input values in equation (35). The limits of integration (performed numerically) are over the 22.5-degree interval for each of the 16 compass points. These graphs give the percentage frequency that the wind will blow from the direction intervals.

2. Mean Wind Components and 80th Interpercentile Range of Wind Components (Figures A-17 through A-32).

The wind component means with respect to any orthogonal axes are obtained by using the zonal and meridional mean wind components in equations (44) and (45). These component means form the circles shown in figures A-17 through A-32. Further, the zonal and meridional wind component variances and correlation coefficients are used in equations (46) and (47) to obtain the variances with respect to any orthogonal axes. These rotated component variances and the rotated component means are used in equation (8) to obtain the 80th interpercentile range of wind components and are then illustrated in figures A-17 through A-32.

3. Probability Ellipses (Figures A-33 through A-48)

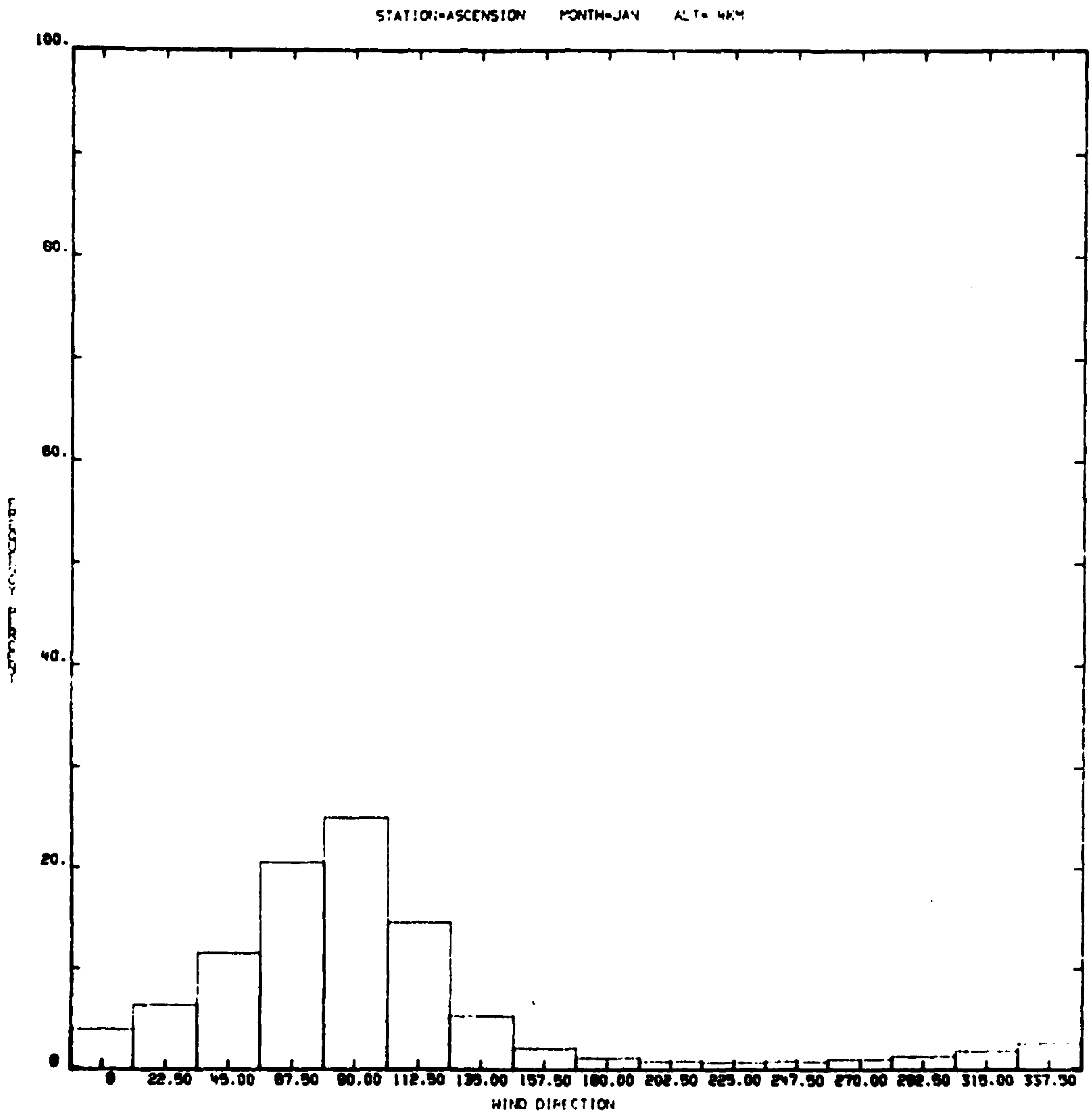
Using the five wind component parameters from tables I.1 and I.7 and $p = 0.50$, $p = 0.95$, and $p = 0.99$ as input values to equation (13), the wind probability ellipses shown in figures A-33 through A-48 were obtained by computer graphics. The statistical inferences are, for example, that 50 percent of the wind vectors lie within the smaller ellipse and 99 percent of the wind vectors lie within the outer ellipse. These probability ellipses are illustrated using the standard meteorological coordinate system explained in section I.B.1.

4. Conditional Windspeed Given the Wind Direction (Figures A-49 through A-64)

The five wind component parameters from table I.1 and table I.7 are used to evaluate the conditional probability distribution function, equation (41). Figures A-49 through A-64 show interpolations of the conditional function made to

obtain the 5th, 15th, 50th (median), 85th, 95th, and 99th conditional percentile values of windspeed, given the wind directions. The conditional mean windspeed, given the wind direction, is obtained from equation (40). The conditional mode (most probable) windspeed, given the wind direction, is obtained from equation (38). The conditional mean windspeed and the conditional windspeed modal value, given the wind direction, are also shown in these figures. For some figures, the conditional windspeed values are invalid for the given wind direction near 270° (from the west). This is caused by the lack of computational precision in evaluating equations (40) and (41) when the arguments for the Gaussian probability distribution have large negative values, i.e., when the coefficients (b/a) become less than -4 in these equations.

This appendix contains only a few of the many options in presenting wind statistics illustrations.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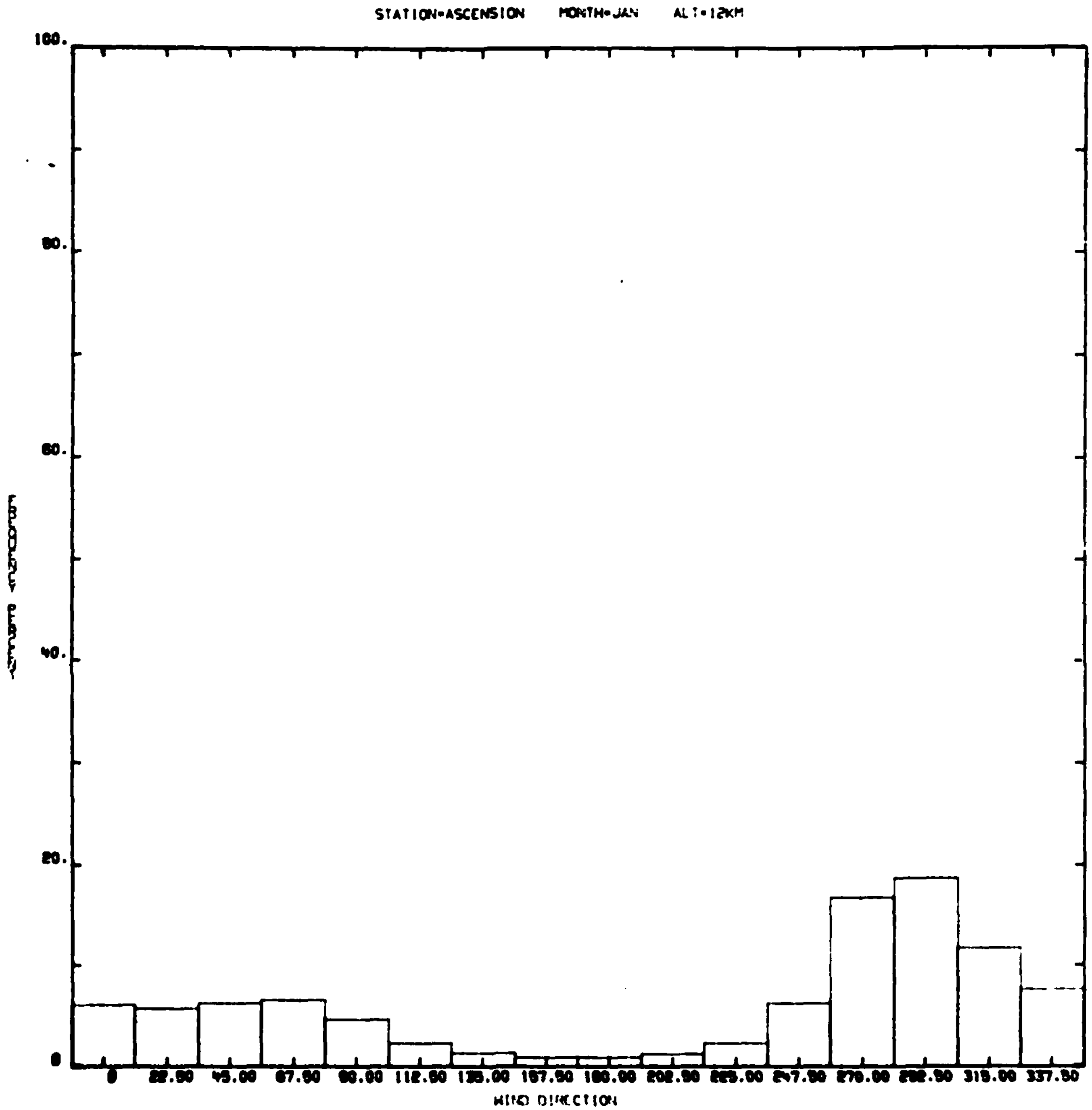
80.
60.
40.
20.
0
0 22.50 45.00 67.50 90.00 112.50 135.00 157.50 180.00 202.50 225.00 247.50 270.00 292.50 315.00 337.50
WIND DIRECTION

Figure A-1.



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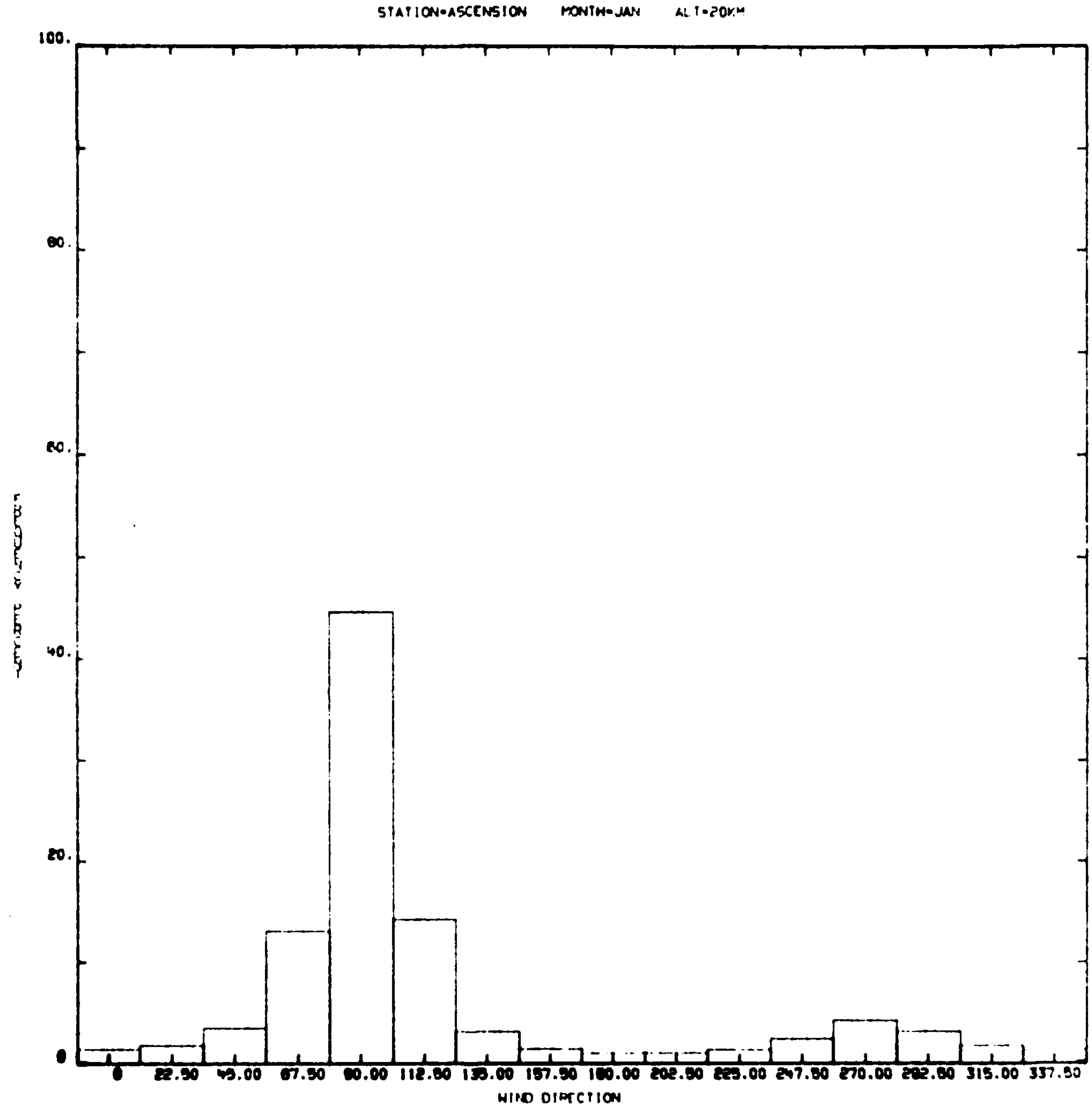
80.
60.
40.
20.
0
FREQUENCY PERCENT
0
22.50
45.00
67.50
90.00
112.50
135.00
157.50
180.00
202.50
225.00
247.50
270.00
292.50
315.00
337.50
WIND DIRECTION

Figure A-2.



STATION=ASCENSION MONTH=JAN ALT=20KM
100.
80.
60.
40.
20.
0
0 22.50 45.00 67.50 90.00 112.50 135.00 157.50 180.00 202.50 225.00 247.50 270.00 292.50 315.00 337.50
WIND DIRECTION

Figure A-3.

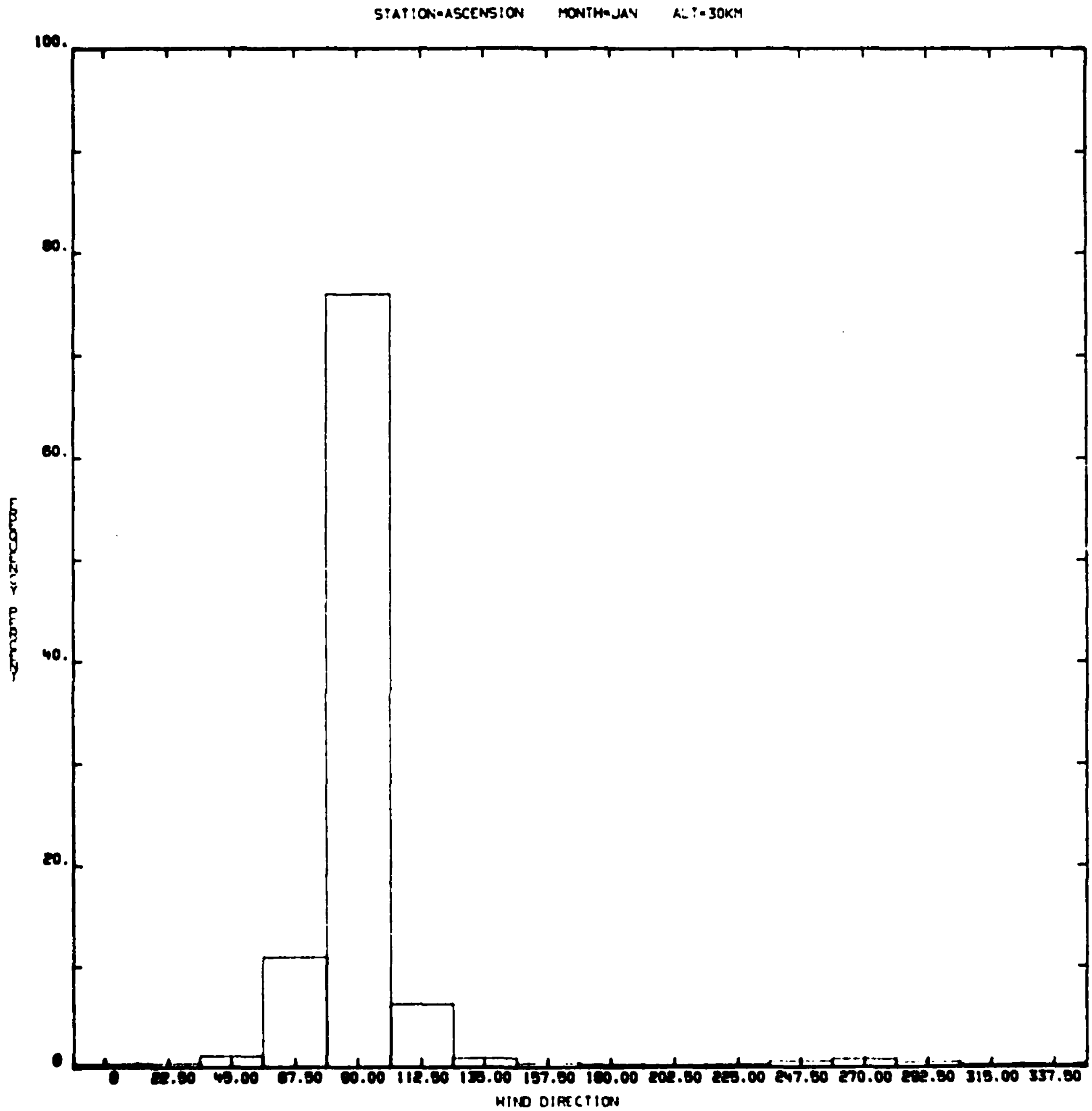
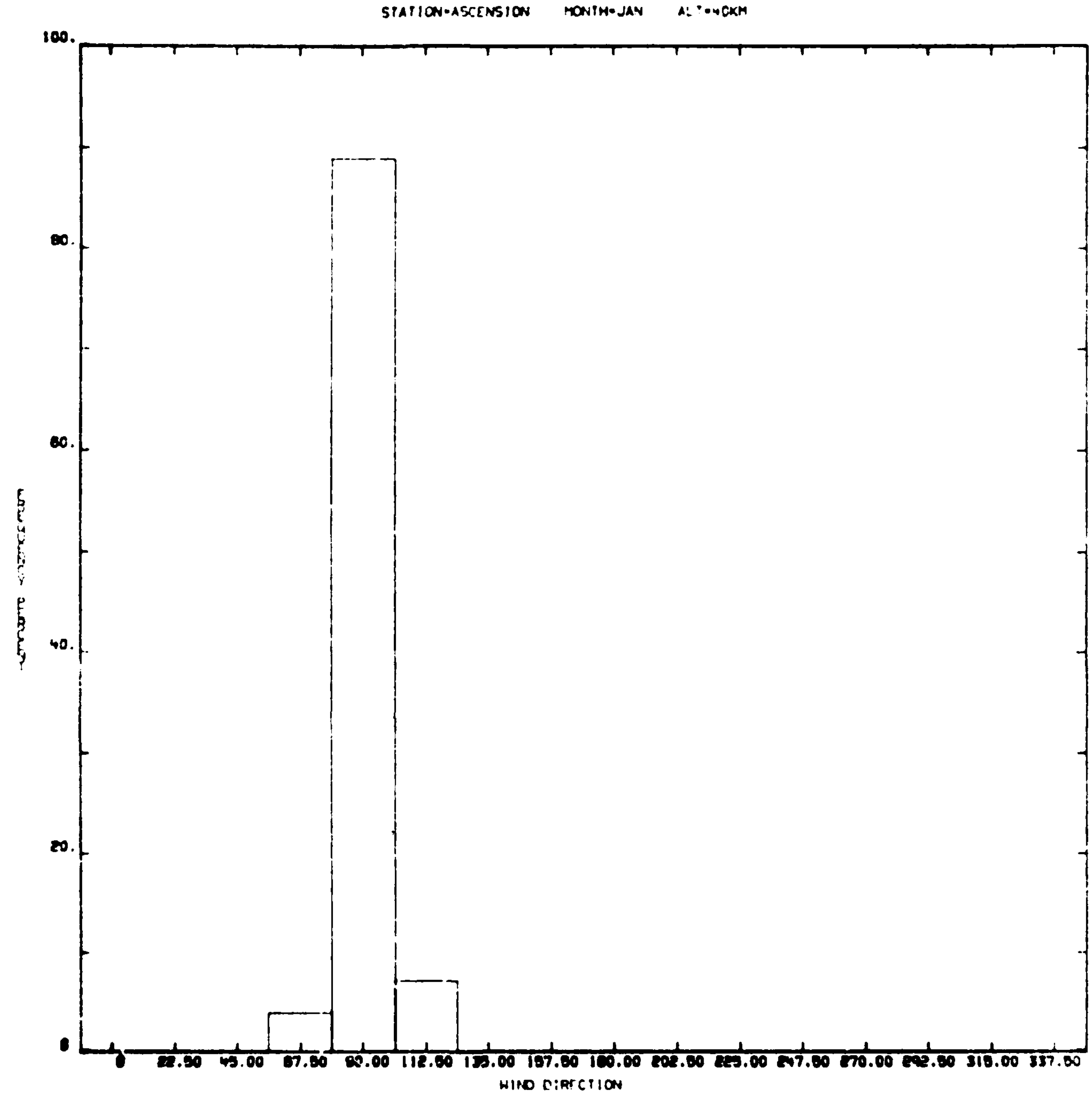

STATION=ASCENSION MONTH=JAN ALT=30KM
FREQUENCY PERCENT
WIND DIRECTION
100.
80.
60.
40.
20.
0
0
22.50
45.00
67.50
90.00
112.50
135.00
157.50
180.00
202.50
225.00
247.50
270.00
292.50
315.00
337.50

Figure A-4.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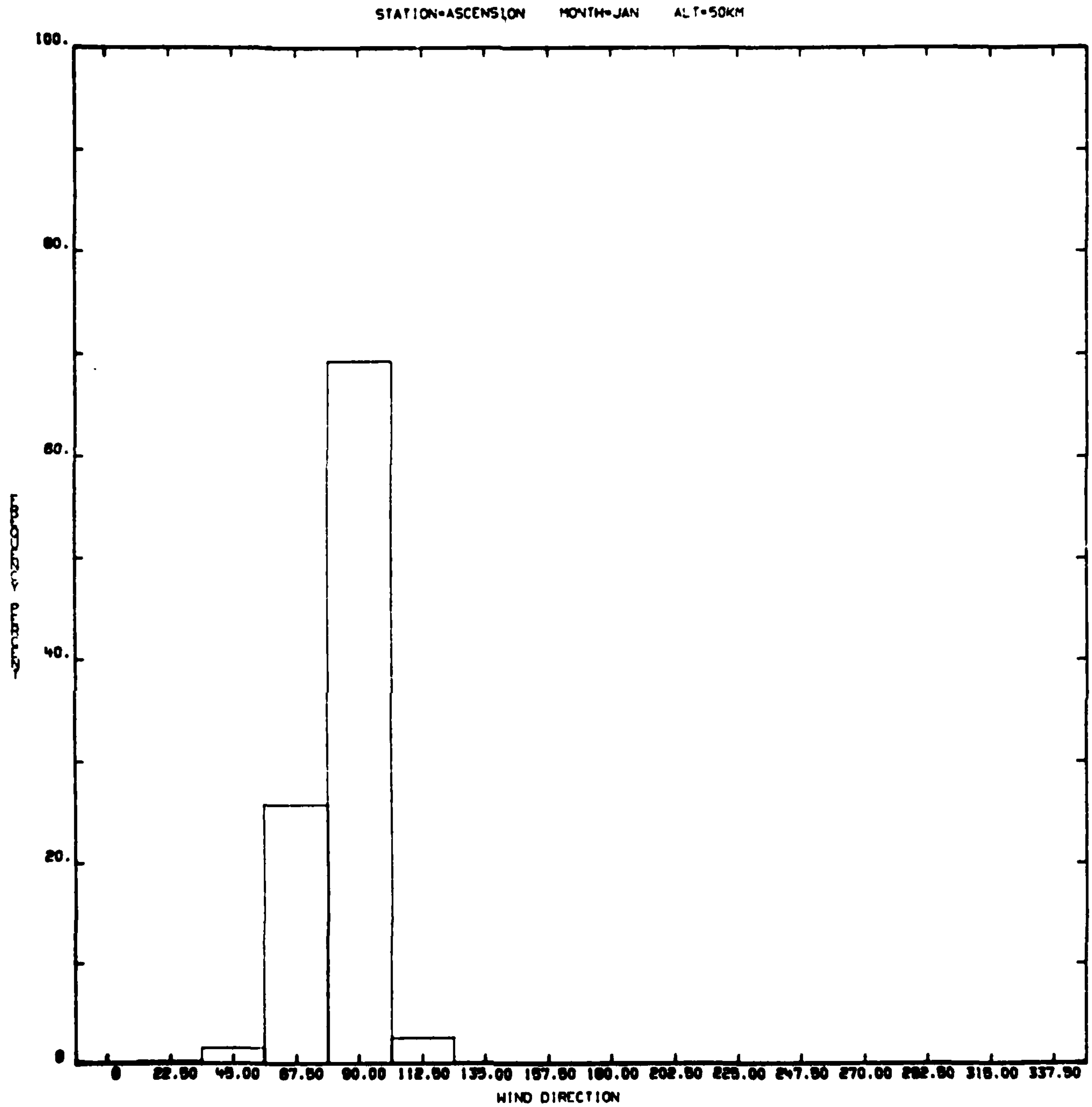
80.
60.
40.
20.
0
0 22.50 45.00 67.50 90.00 112.50 135.00 157.50 180.00 202.50 225.00 247.50 270.00 292.50 315.00 337.50
WIND DIRECTION

Figure A-5.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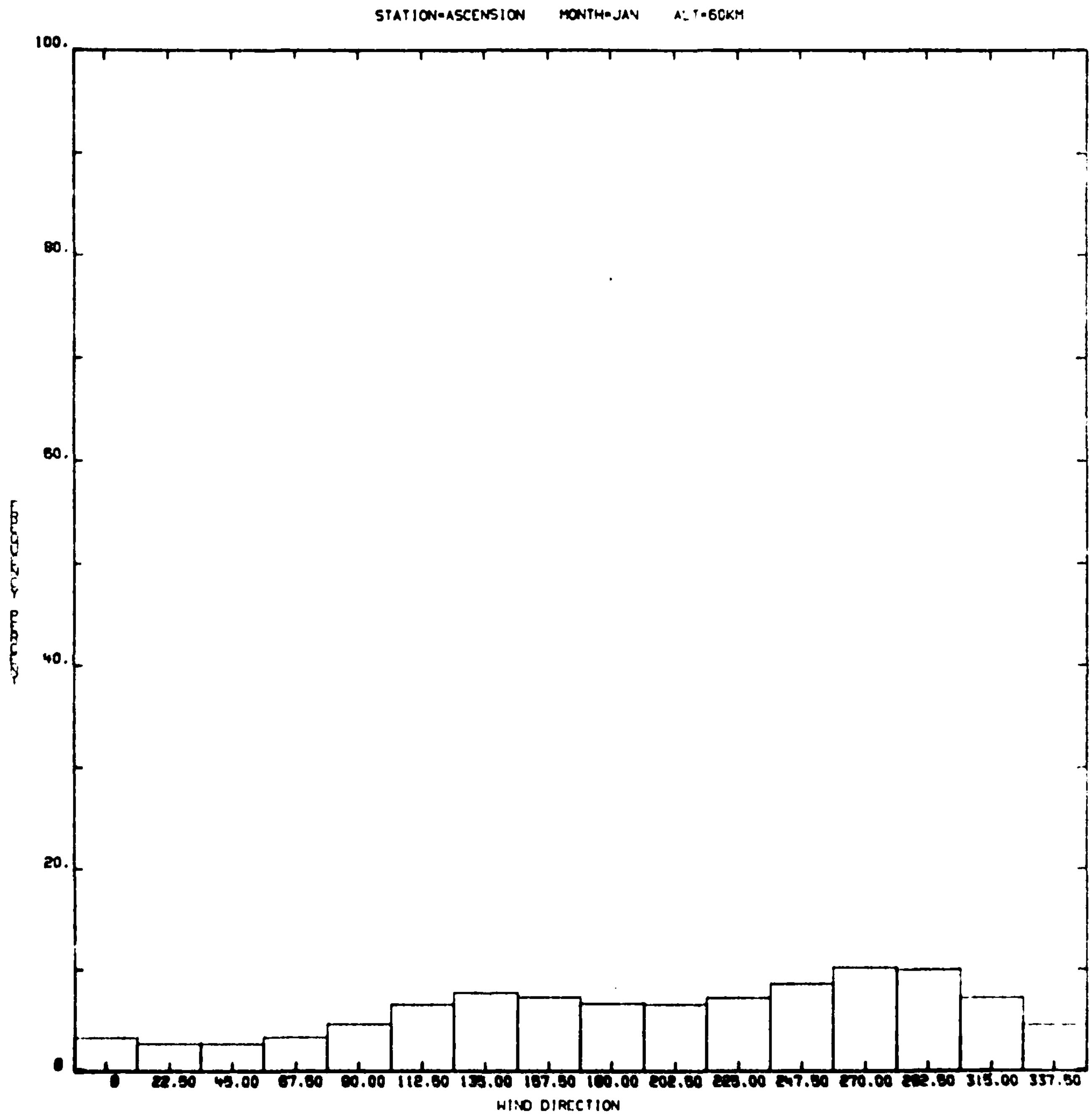
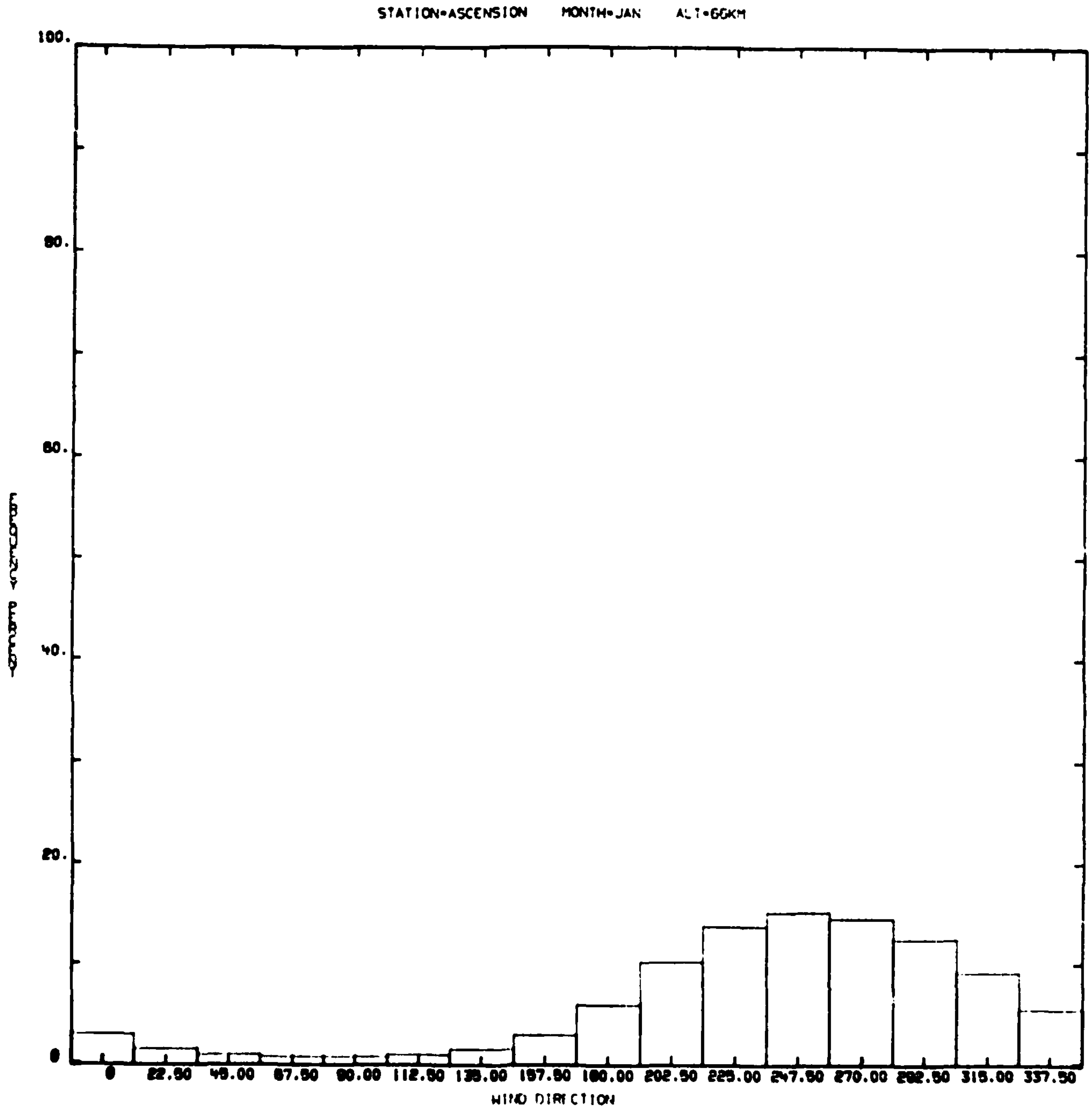
80.
60.
40.
20.
0
FREQUENCY PERCENT
0
22.50
45.00
67.50
90.00
112.50
135.00
157.50
180.00
202.50
225.00
247.50
270.00
292.50
315.00
337.50
WIND DIRECTION

Figure A-6.



STATION=ASCENSION MONTH=JAN ALT=60KM
100.
80.
60.
40.
20.
0
0
22.50
45.00
67.50
90.00
112.50
135.00
157.50
180.00
202.50
225.00
247.50
270.00
292.50
315.00
337.50
WIND DIRECTION

Figure A-7.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80.
60.
40.
20.
0
FREQUENCY PERCENT
0
22.50
45.00
67.50
90.00
112.50
135.00
157.50
180.00
202.50
225.00
247.50
270.00
292.50
315.00
337.50
WIND DIRECTION

Figure A-8.

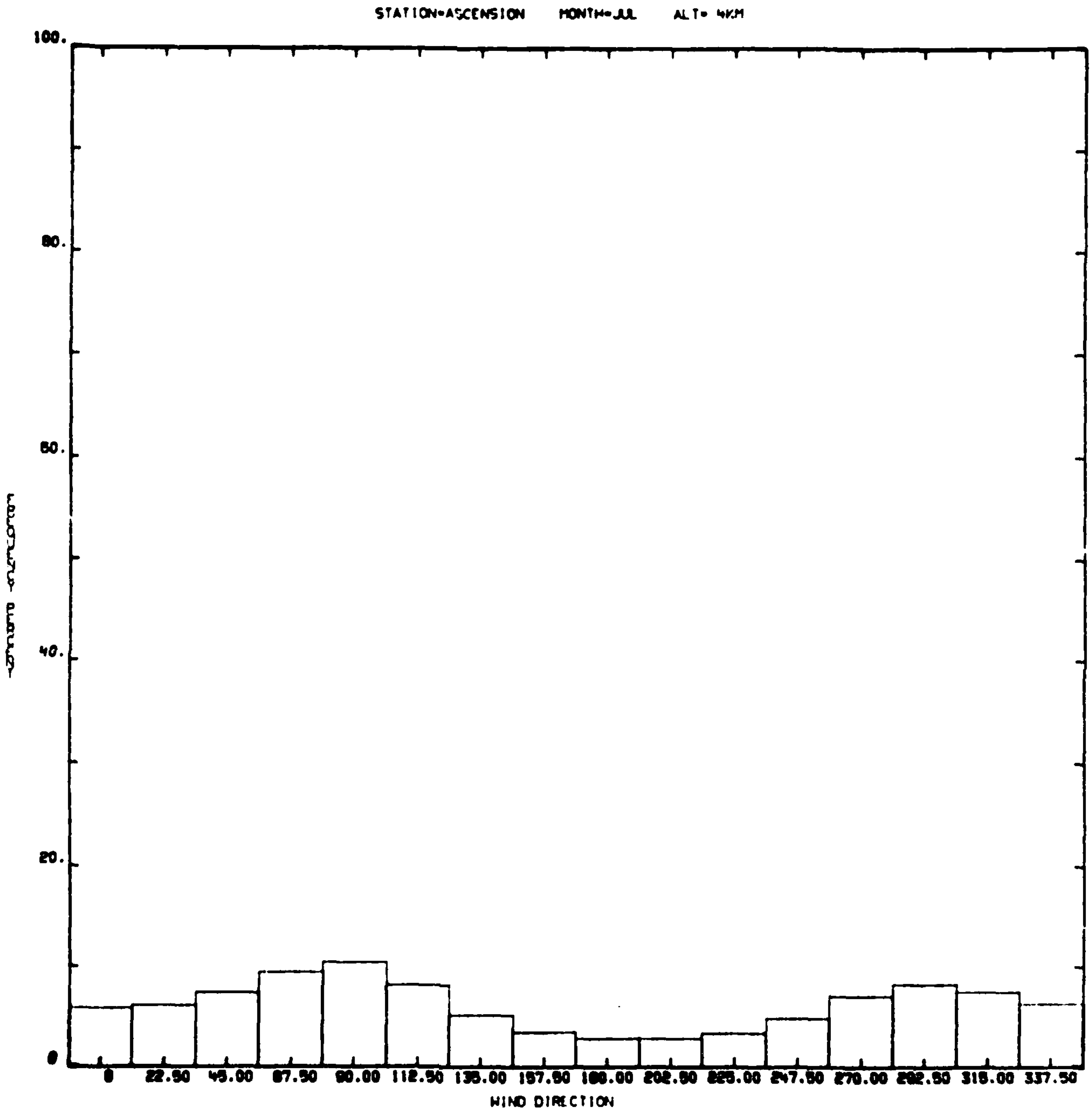

STATION=ASCENSION MONTH=JUL ALT= 4KM
100.
80.
60.
40.
20.
0
0 22.50 45.00 67.50 90.00 112.50 135.00 157.50 180.00 202.50 225.00 247.50 270.00 292.50 315.00 337.50
WIND DIRECTION

Figure A-9.

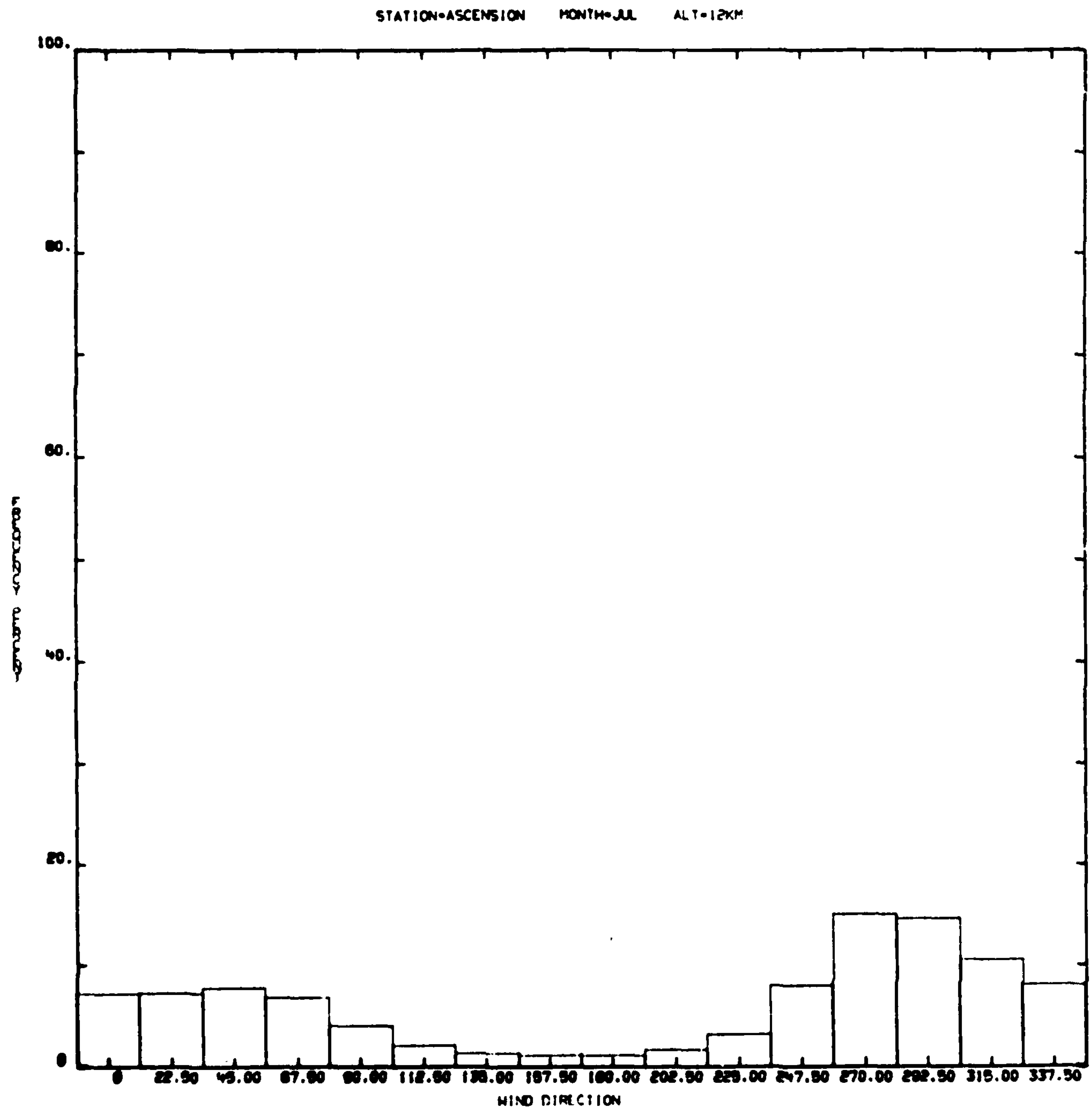

STATION=ASCENSION MONTH=JUL ALT=12KM
100.
80.
60.
40.
20.
0
FREQUENCY PERCENT
0 22.50 45.00 67.50 90.00 112.50 135.00 157.50 180.00 202.50 225.00 247.50 270.00 292.50 315.00 337.50
WIND DIRECTION

Figure A-10.

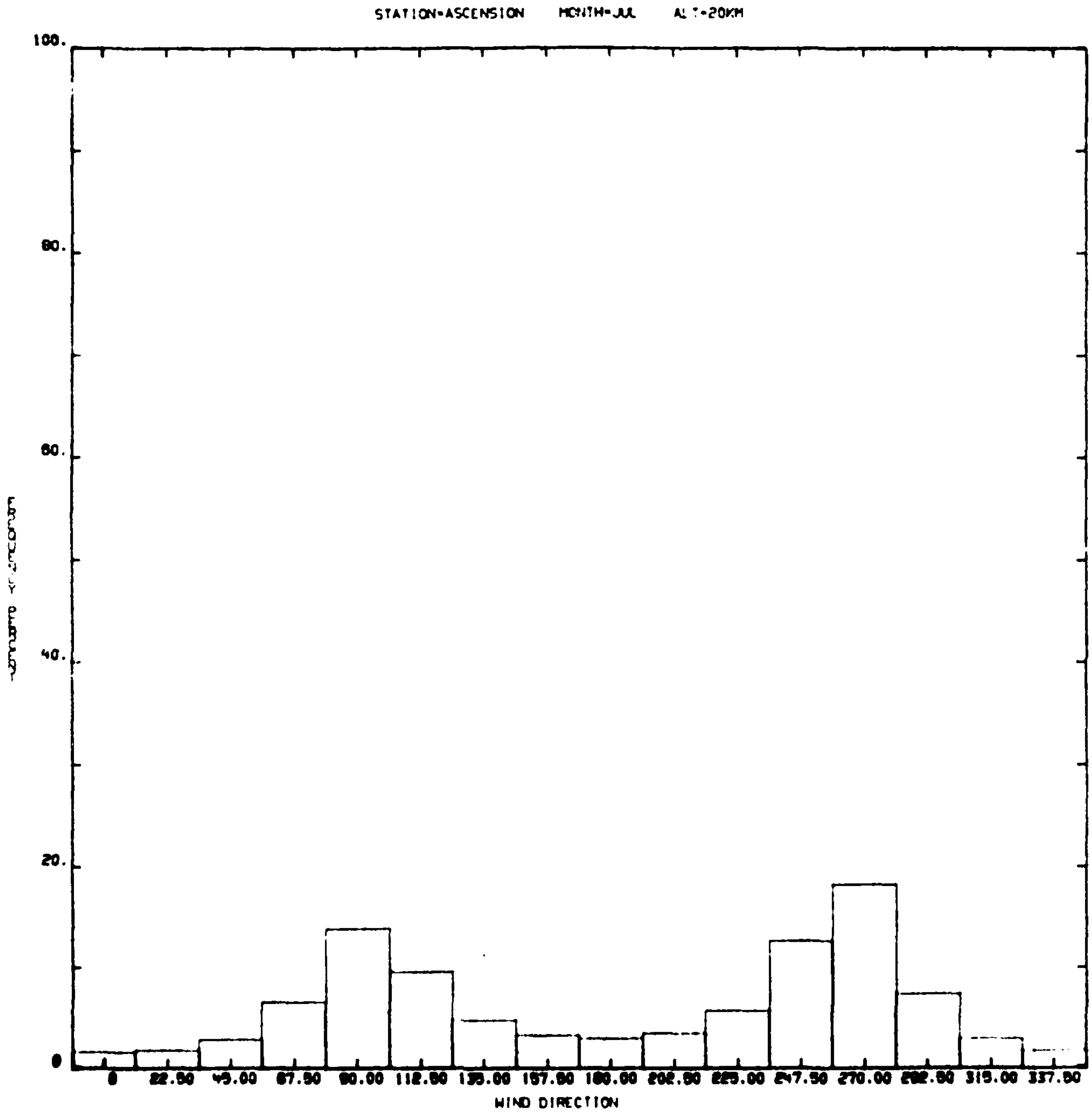

STATION=ASCENSION MONTH=JUL ALT=20KM
100.
80.
60.
40.
20.
0
0
22.50
45.00
67.50
90.00
112.50
135.00
157.50
180.00
202.50
225.00
247.50
270.00
292.50
315.00
337.50
WIND DIRECTION

Figure A-11.

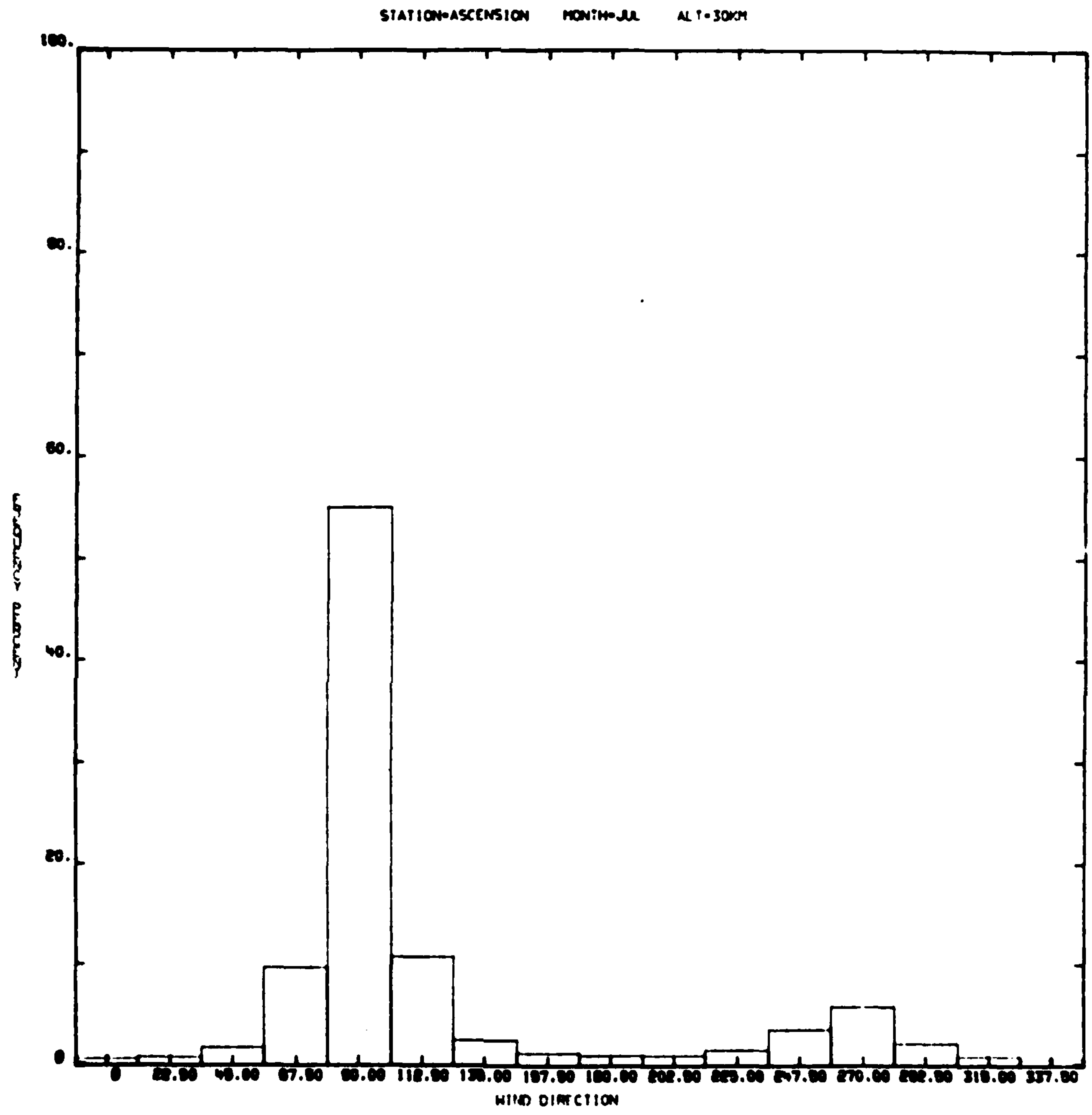


Figure A-12.

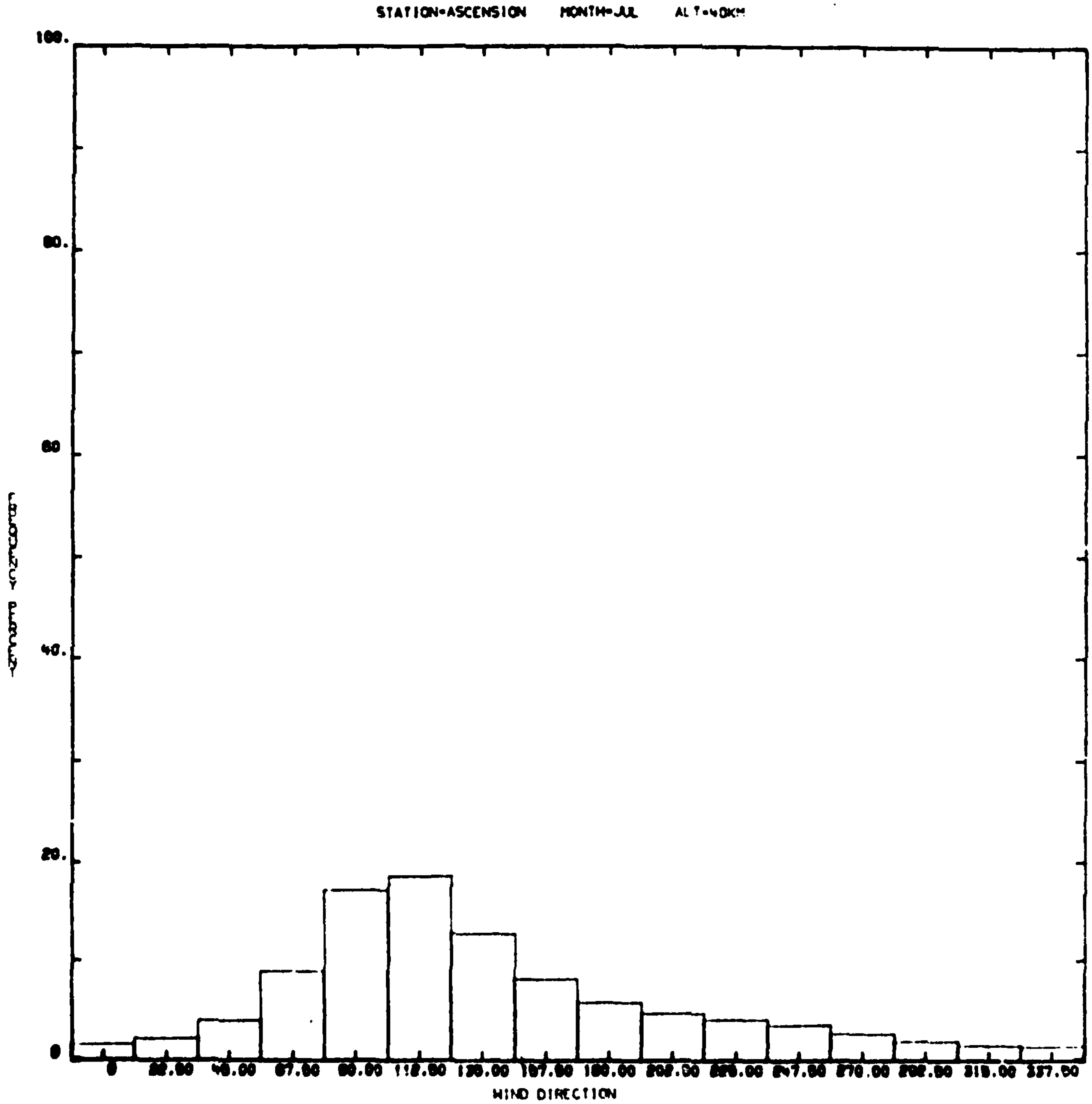

STATION=ASCENSION MONTH=JUL ALT=40KM
100.
80.
60
40.
20.
0
FREQUENCY PERCENT
0
22.50
45.00
67.50
90.00
112.50
135.00
157.50
180.00
202.50
225.00
247.50
270.00
292.50
315.00
337.50
WIND DIRECTION

Figure A-13.

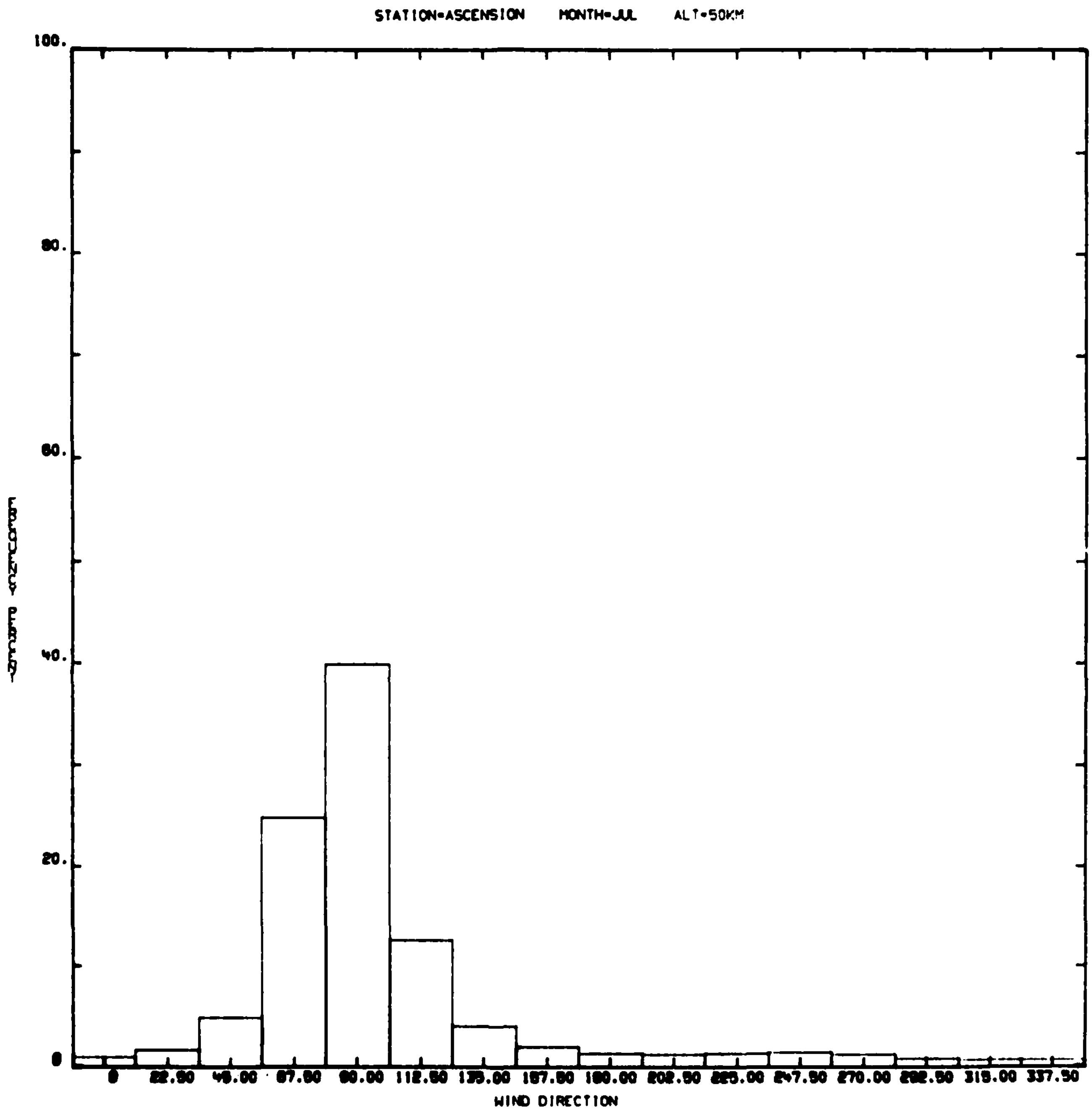
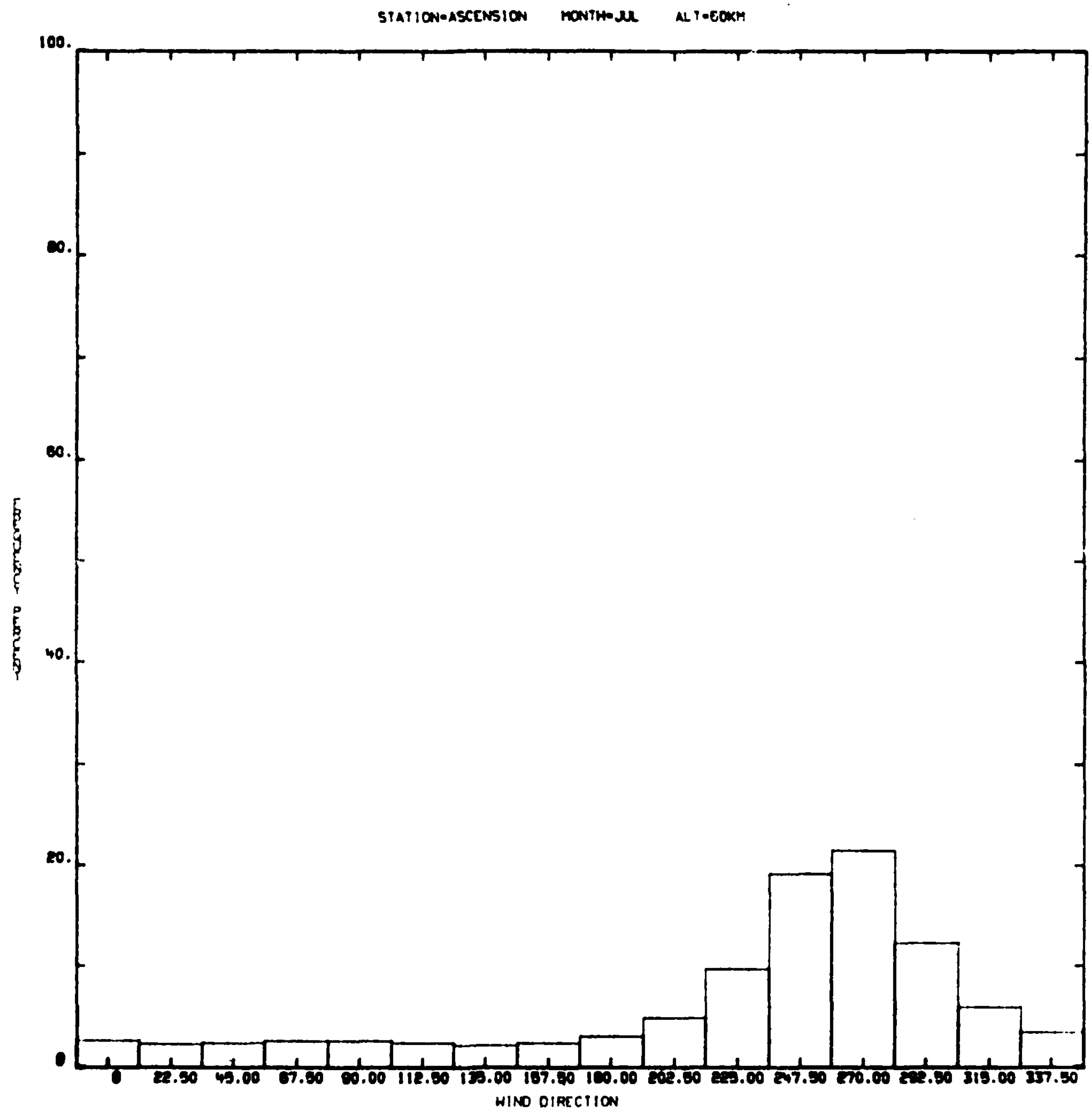

STATION=ASCENSION MONTH=JUL ALT=50KM
100.
80.
60.
40.
20.
0
FREQUENCY PERCENT
0
22.50
45.00
67.50
90.00
112.50
135.00
157.50
180.00
202.50
225.00
247.50
270.00
292.50
315.00
337.50
WIND DIRECTION

Figure A-14.



STATION=ASCENSION MONTH=JUL ALT=60KM
100.
80.
60.
40.
20.
0
0
22.50
45.00
67.50
90.00
112.50
135.00
157.50
180.00
202.50
225.00
247.50
270.00
292.50
315.00
337.50
WIND DIRECTION

Figure A-15.

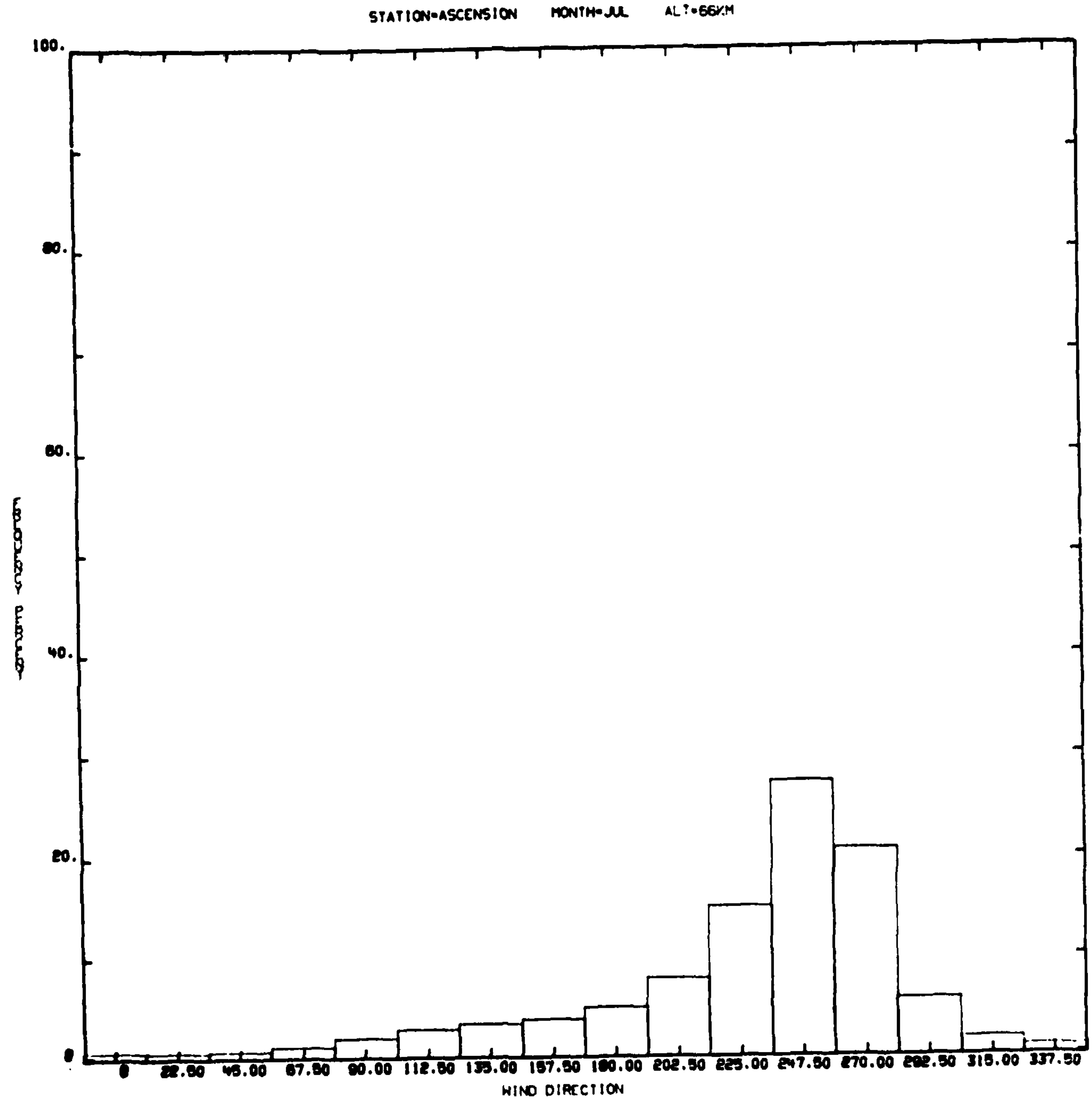

STATION=ASCENSION MONTH=JUL ALT=66KM
100.
80.
60.
40.
20.
0
FREQUENCY PERCENT
0
22.50
45.00
67.50
90.00
112.50
135.00
157.50
180.00
202.50
225.00
247.50
270.00
292.50
315.00
337.50
WIND DIRECTION

Figure A-16.

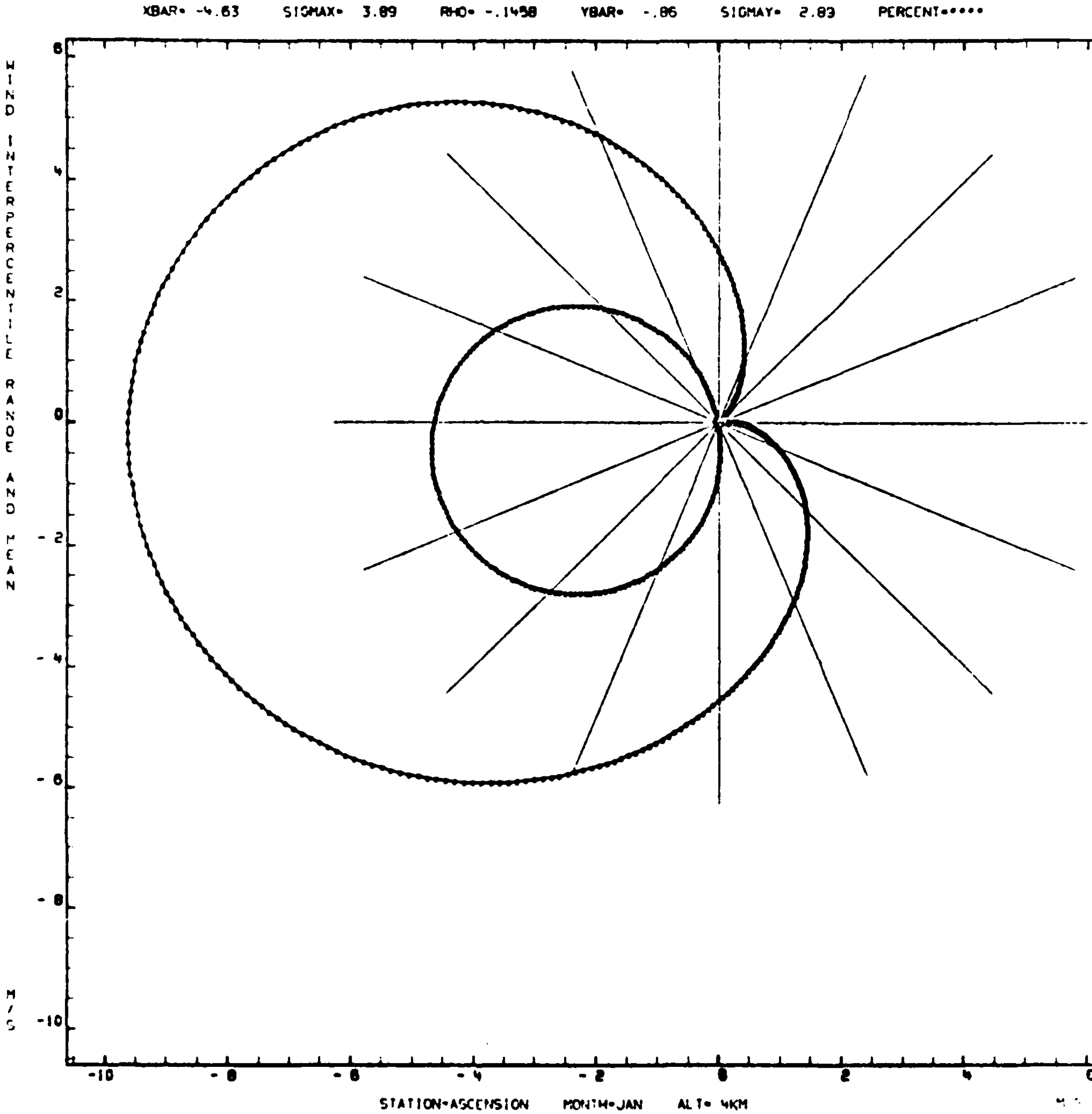

XBAR= -4.63 SIGMAX= 3.89 RHO= -.1458 YBAR= -.86 SIGMAY= 2.83 PERCENT=****
WIND INTERPERCENTILE RANGE AND MEAN
M/S
6
4
2
0
-2
-4
-6
-8
-10
-10 -8 -6 -4 -2 0 2 4 6
STATION=ASCENSION MONTH=JAN ALT= 4KM

Figure A-17.

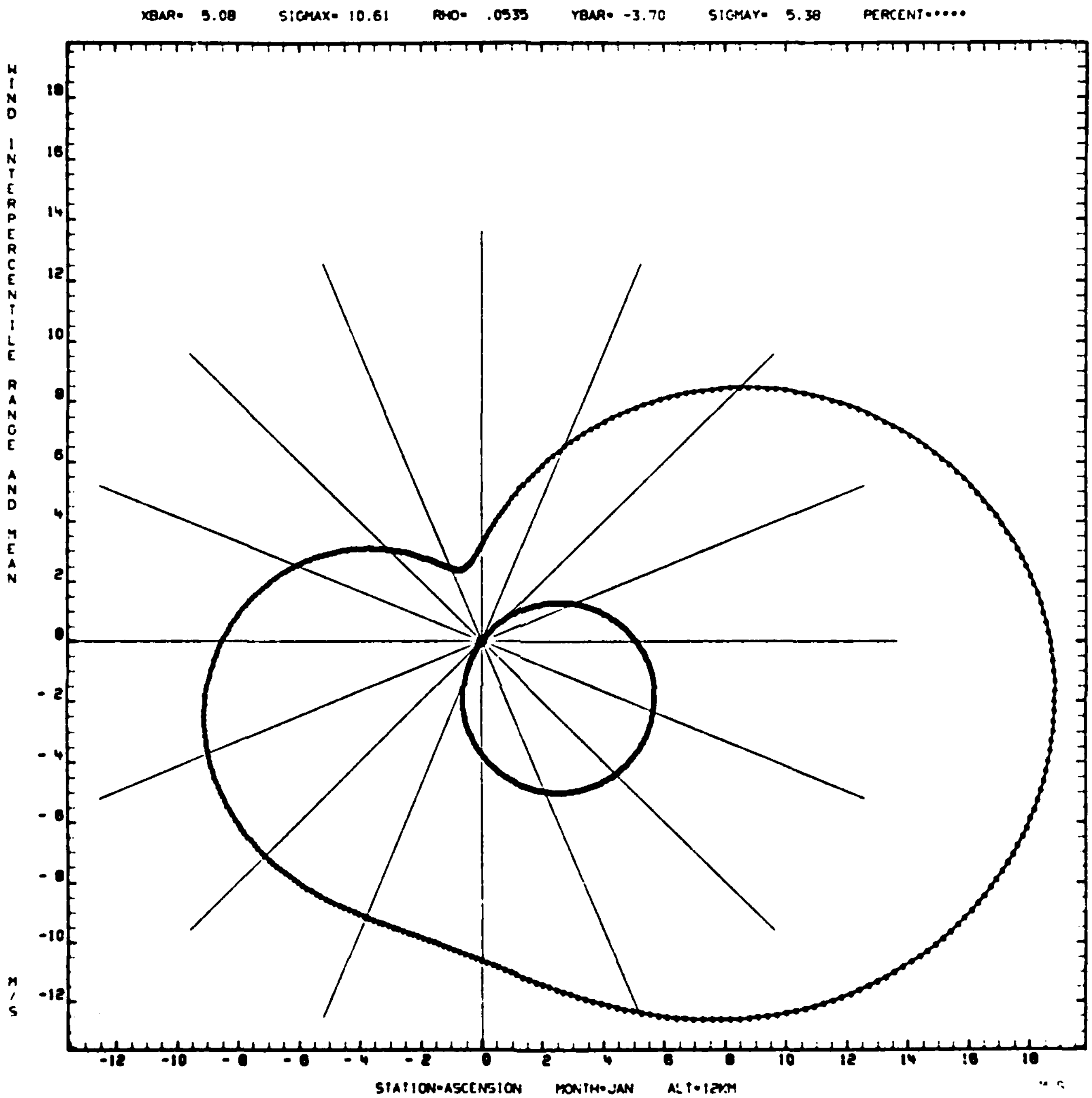

XBAR= 5.08 SIGMAX= 10.61 RHO= .0535 YBAR= -3.70 SIGMAY= 5.38 PERCENT=****
WIND INTERPERCENTILE RANGE AND MEAN
M/S
18
16
14
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-12 -10 -8 -6 -4 -2 0 2 4 6 8 10 12 14 16 18
STATION=ASCENSION MONTH=JAN ALT=12KM

Figure A-18.

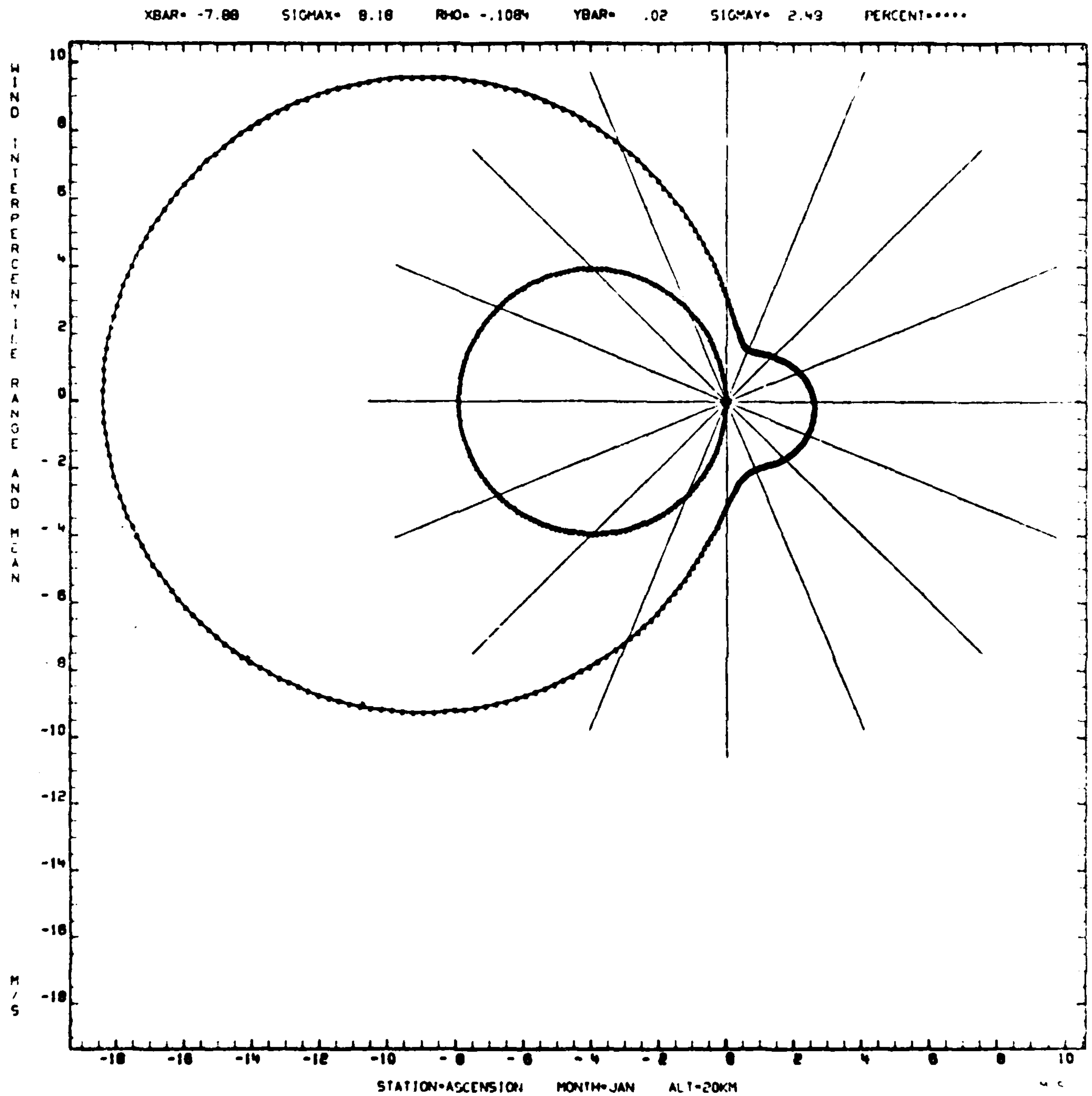
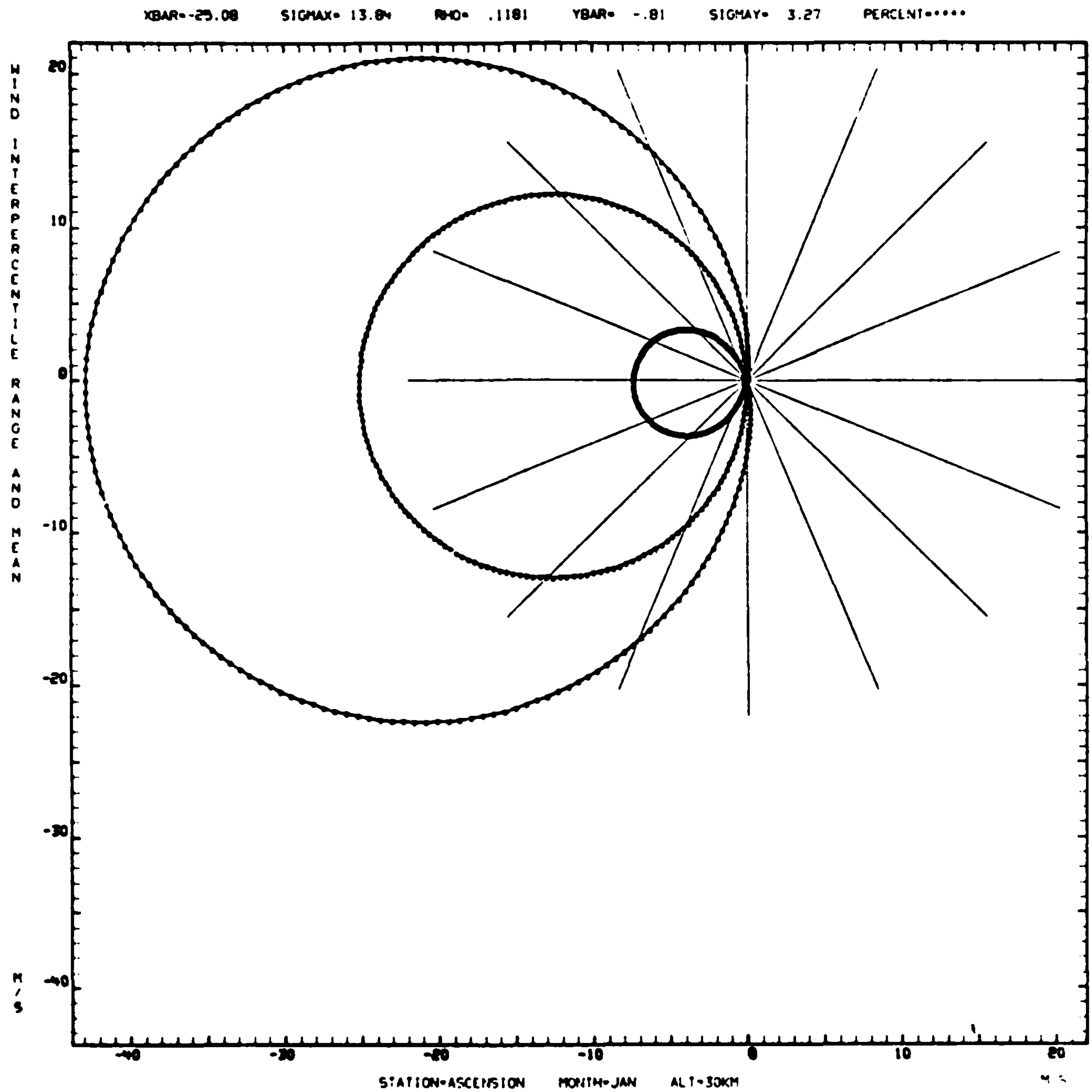

XBAR= -7.88 SIGMAX= 8.18 RHO= -.1084 YBAR= .02 SIGMAY= 2.49 PERCENT=****
WIND INTERPERCENTILE RANGE AND MEAN M/S
STATION=ASCENSION MONTH=JAN ALT=20KM

Figure A-19.



XBAR=-25.08 SIGMAX= 13.84 RHO= .1181 YBAR= -.81 SIGMAY= 3.27 PERCENT=****
WIND INTERPERCENTILE RANGE AND MEAN M/S
STATION=ASCENSION MONTH=JAN ALT=30KM

Figure A-20.

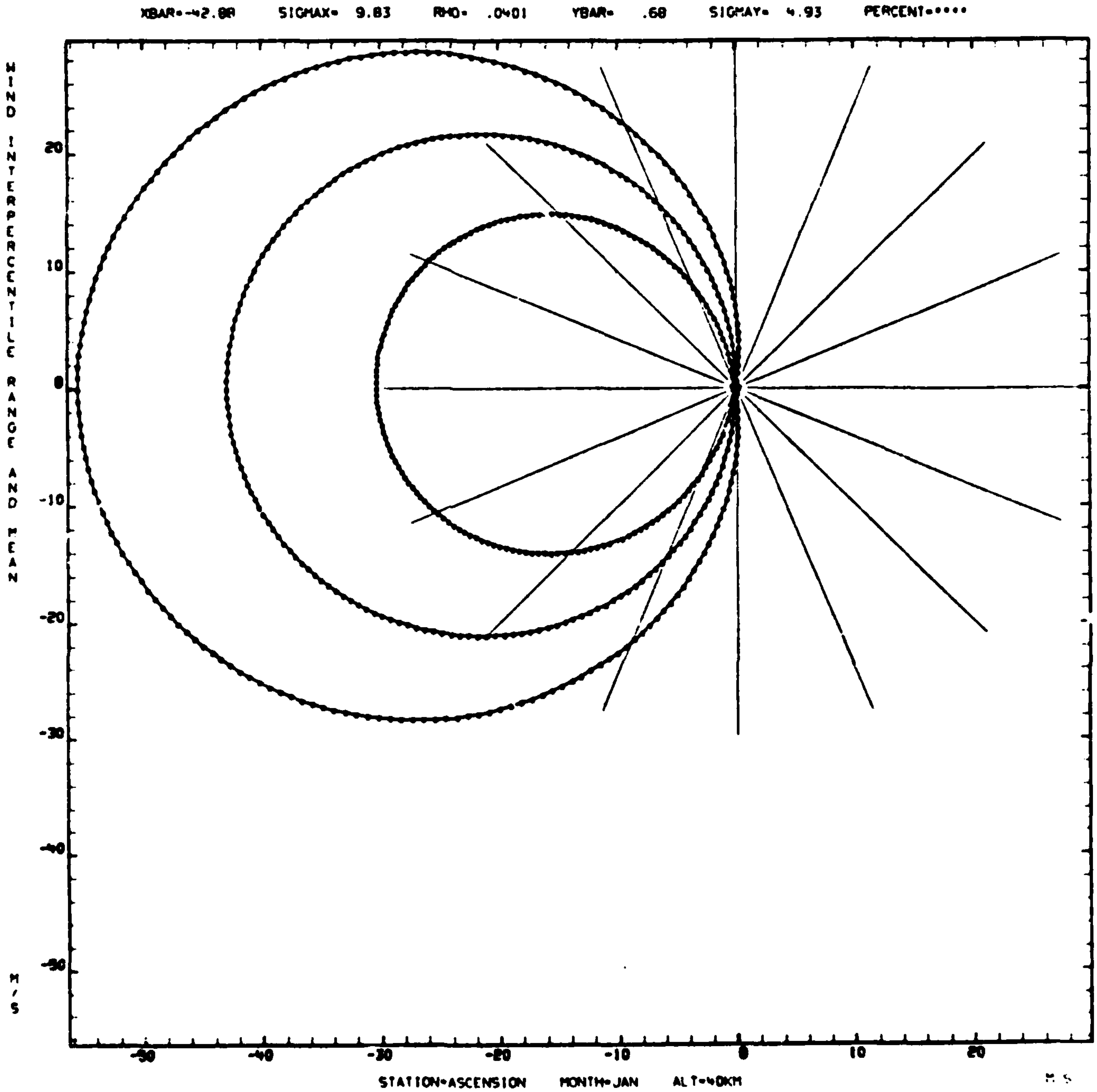
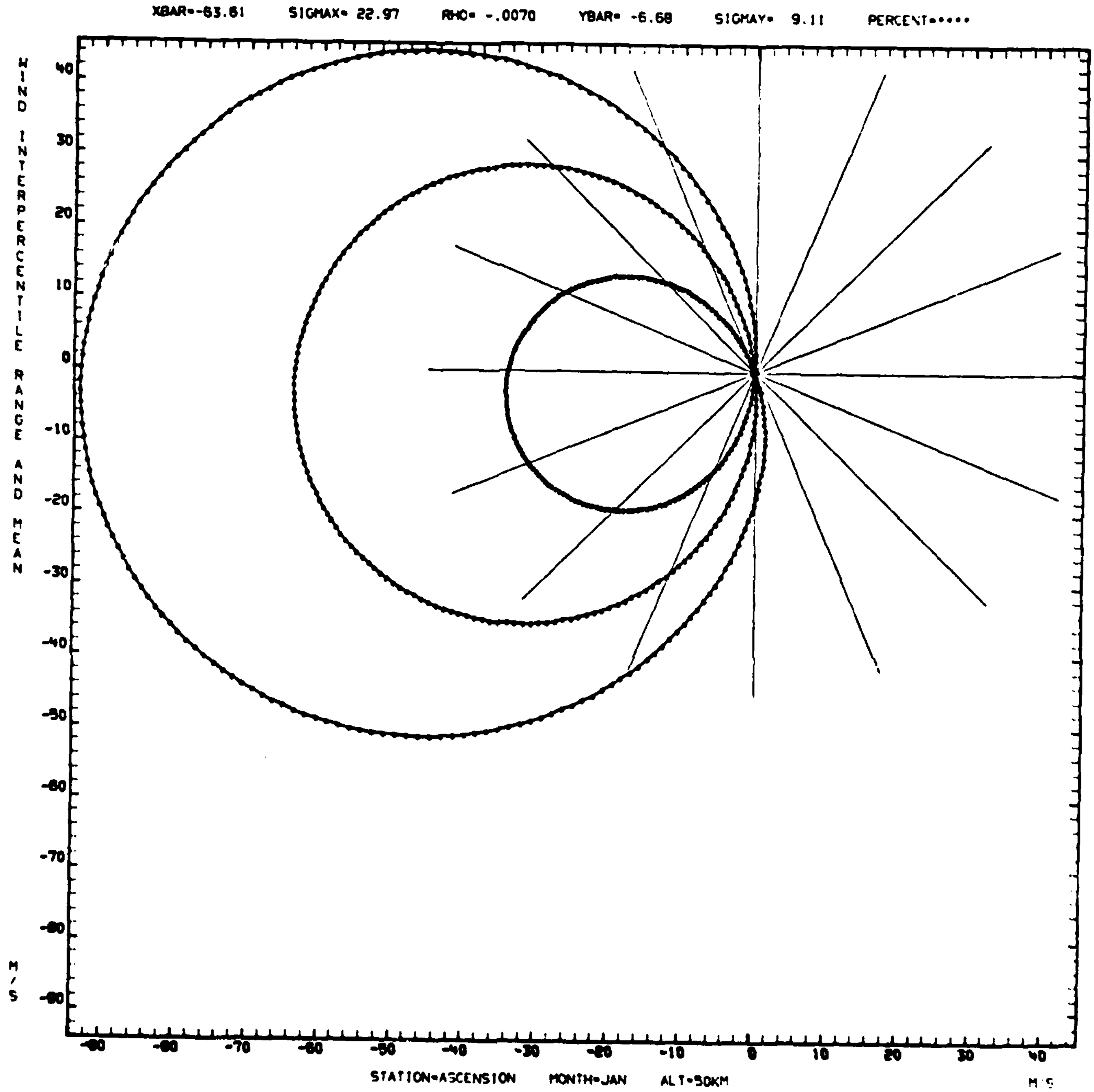
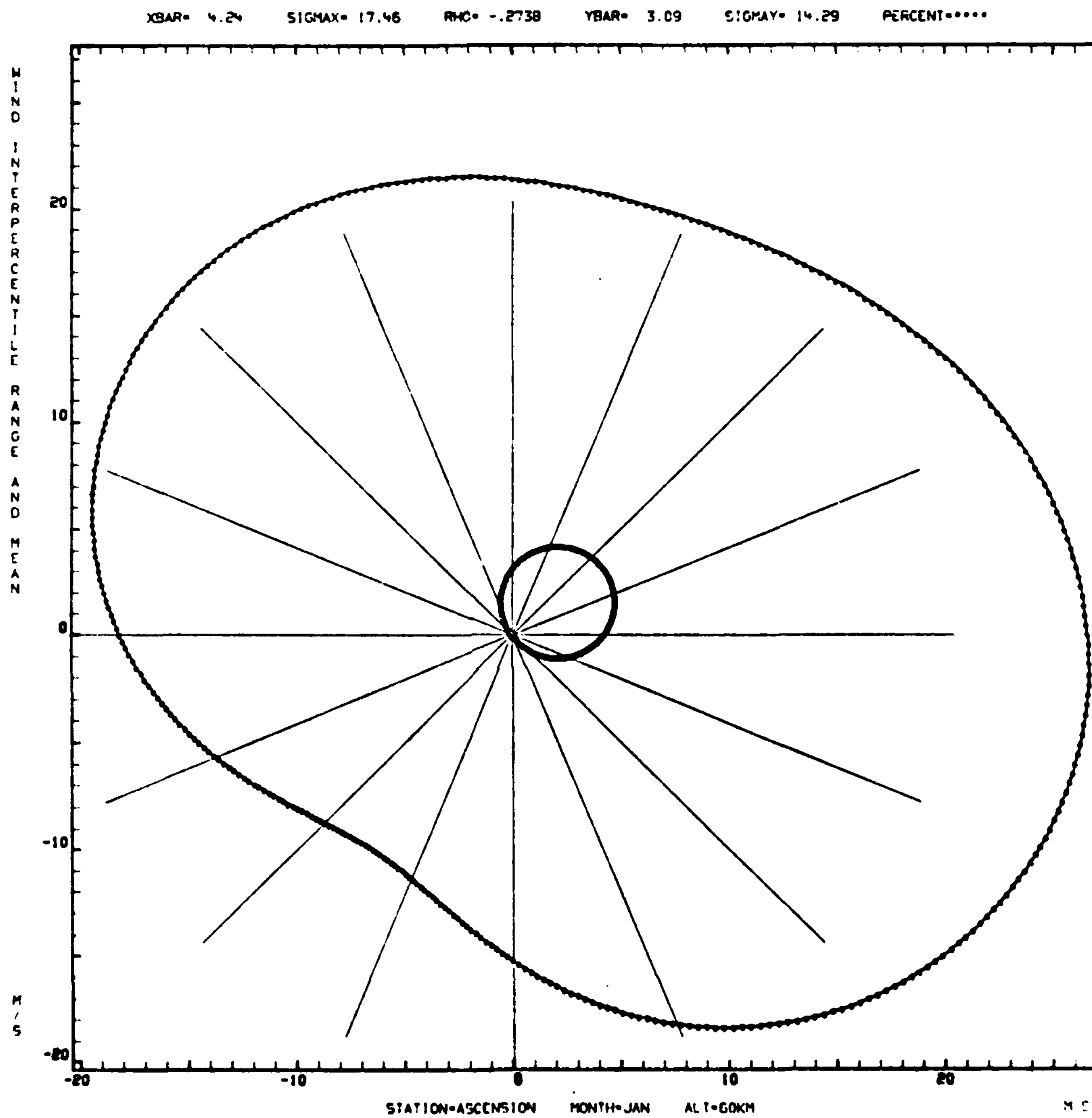

XBAR=-42.88 SIGMAX= 9.83 RHO= .0401 YBAR= .68 SIGMAY= 4.93 PERCENT=****
WIND INTERPERCENTILE RANGE AND MEAN
M/S
20
10
0
-10
-20
-30
-40
-50
-50
-40
-30
-20
-10
0
10
20
STATION=ASCENSION MONTH=JAN ALT=40KM
M/S

Figure A-21.



XBAR=-63.61 SIGMAX= 22.97 RHO= -.0070 YBAR= -6.68 SIGMAY= 9.11 PERCENT=****
WIND INTERPERCENTILE RANGE AND MEAN
M/S
STATION=ASCENSION MONTH=JAN ALT=50KM
M/S

Figure A-22.



XBAR= 4.24 SIGMAX= 17.46 RHO= -.2738 YBAR= 3.09 SIGMAY= 14.29 PERCENT=****
WIND INTERPERCENTILE RANGE AND MEAN
M/S
20
10
0
-10
-20
-20
-10
0
10
20
STATION=ASCENSION MONTH=JAN ALT=60KM

Figure A-23.

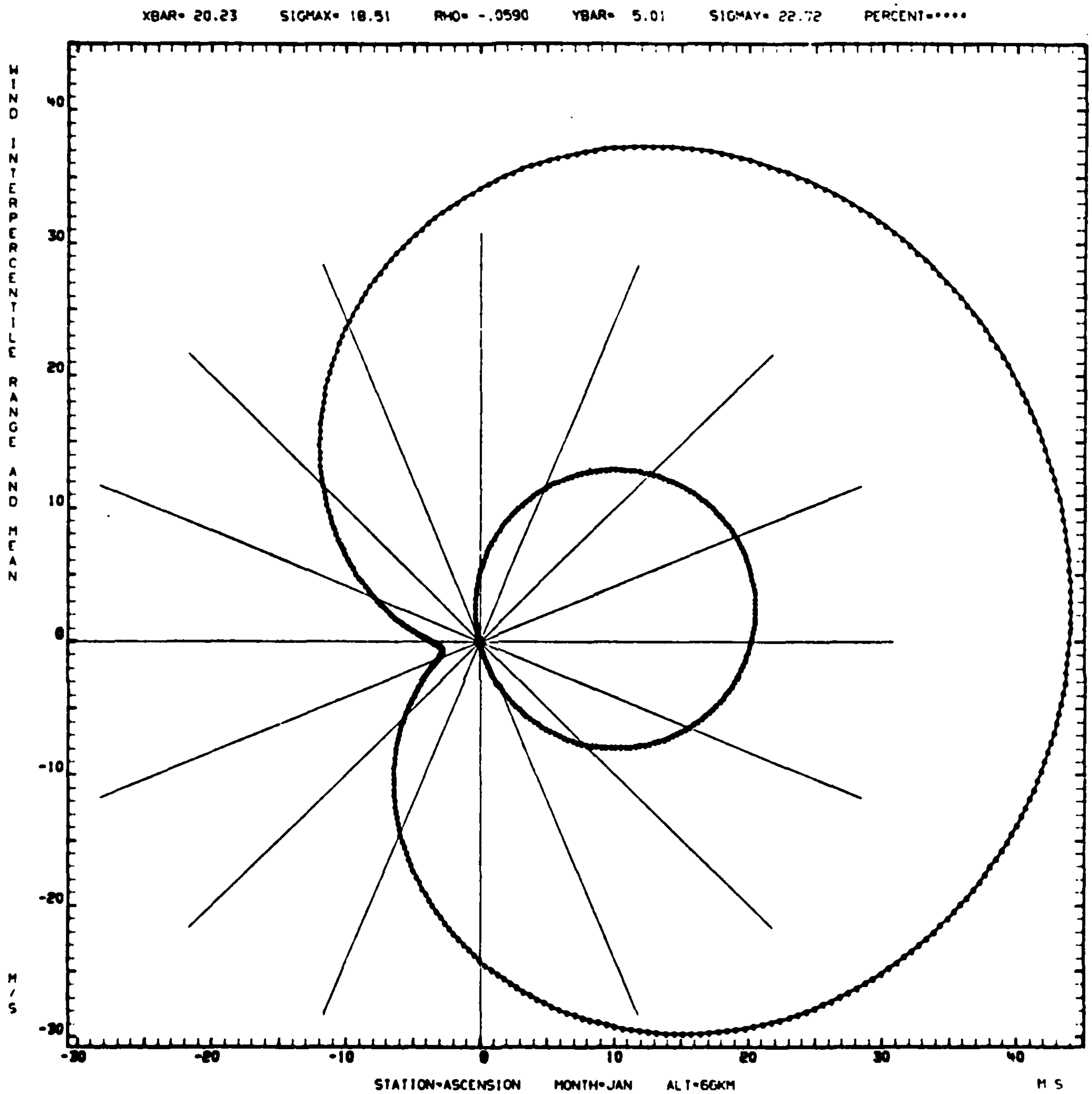

XBAR= 20.23 SIGMAX= 18.51 RHO= -.0590 YBAR= 5.01 SIGMAY= 22.72 PERCENT=****
WIND INTERPERCENTILE RANGE AND MEAN
M/S
40
30
20
10
0
-10
-20
-30
-30
-20
-10
0
10
20
30
40
STATION=ASCENSION MONTH=JAN ALT=66KM
M S

Figure A-24.

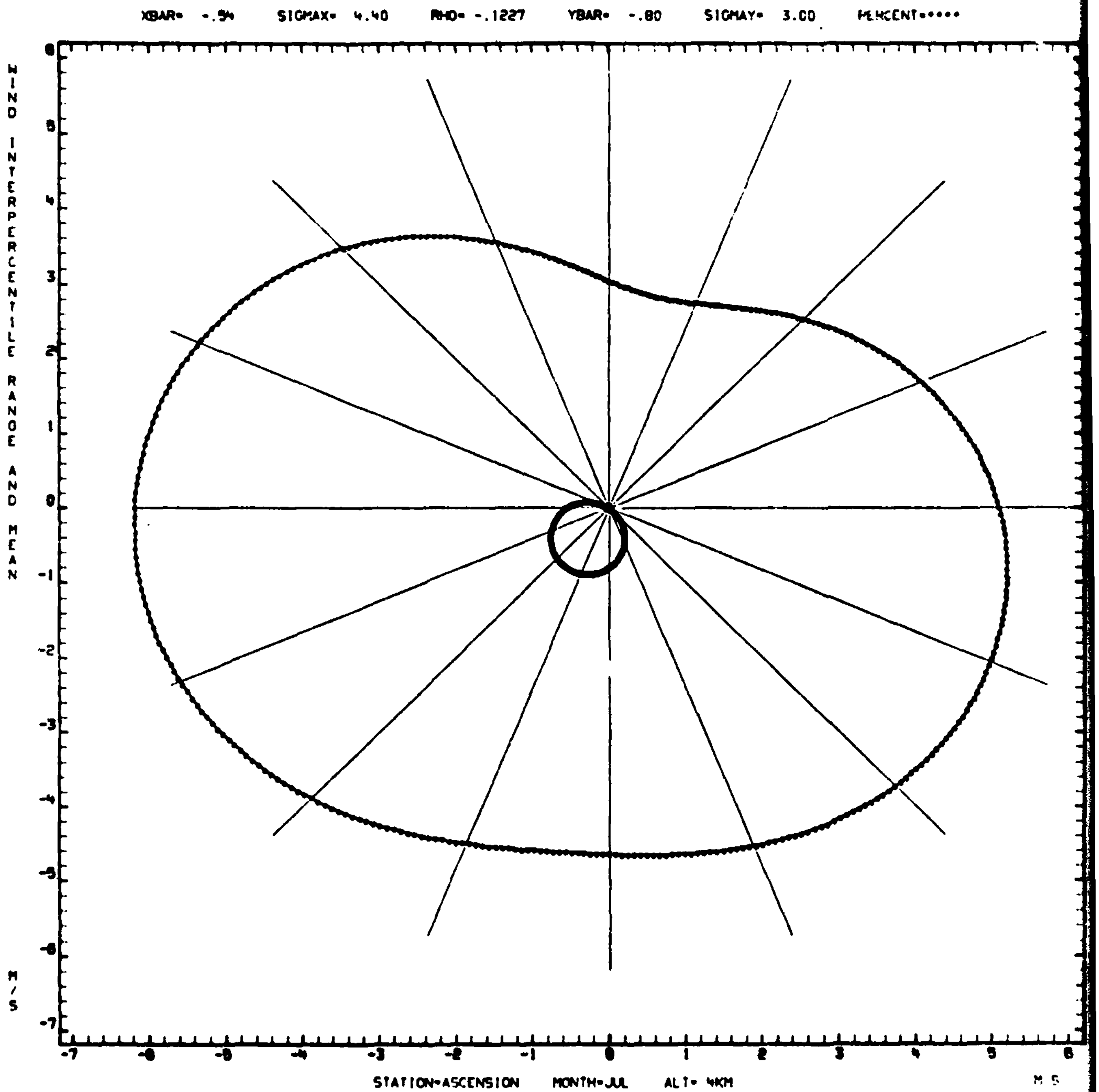

XBAR= -.54 SIGMAX= 4.40 RHO= -.1227 YBAR= -.80 SIGMAY= 3.00 PERCENT=****
WIND INTERPERCENTILE RANGE AND MEAN
M/S
STATION=ASCENSION MONTH=JUL ALT= 4KM
M/S

Figure A-25.

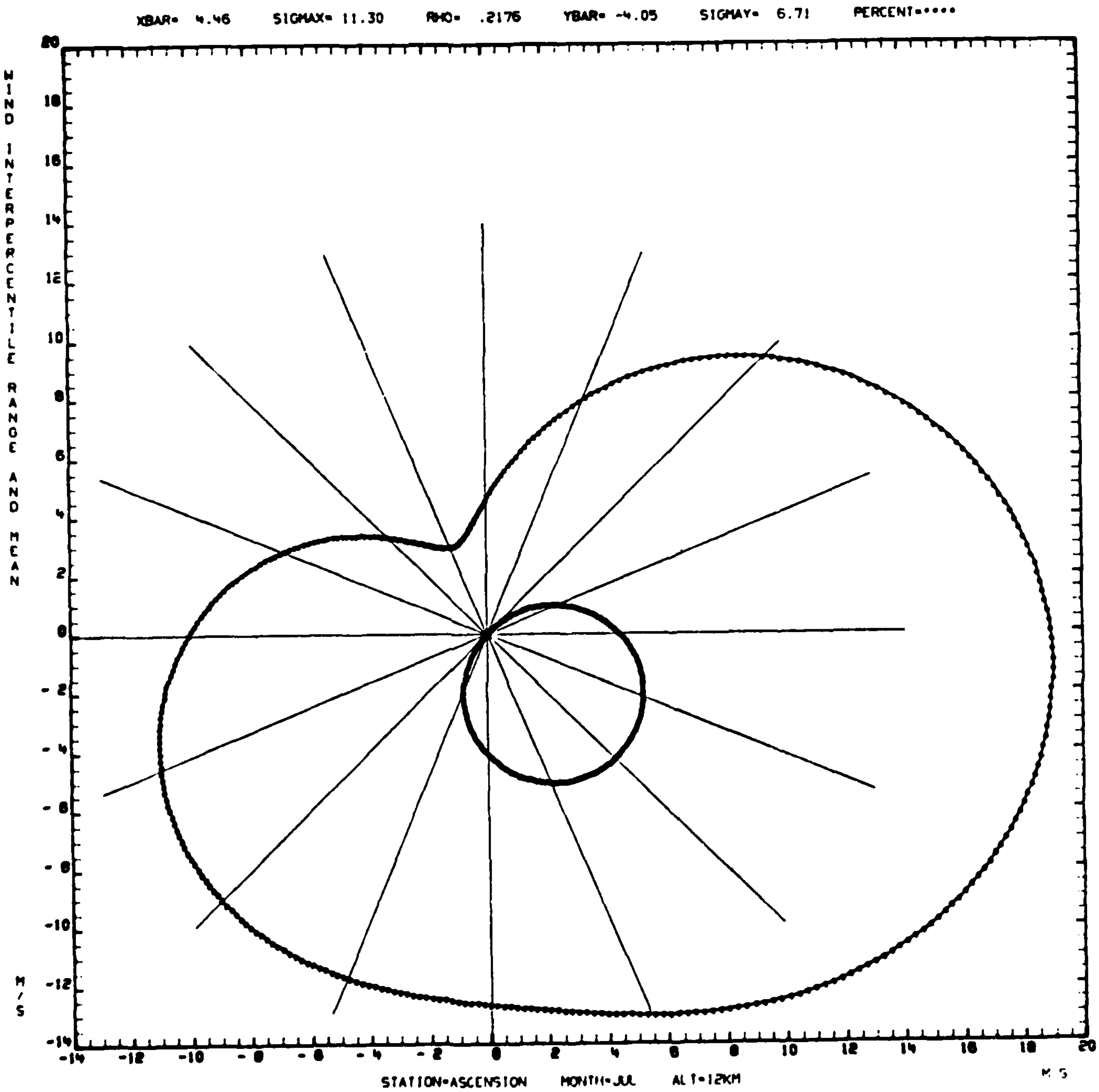
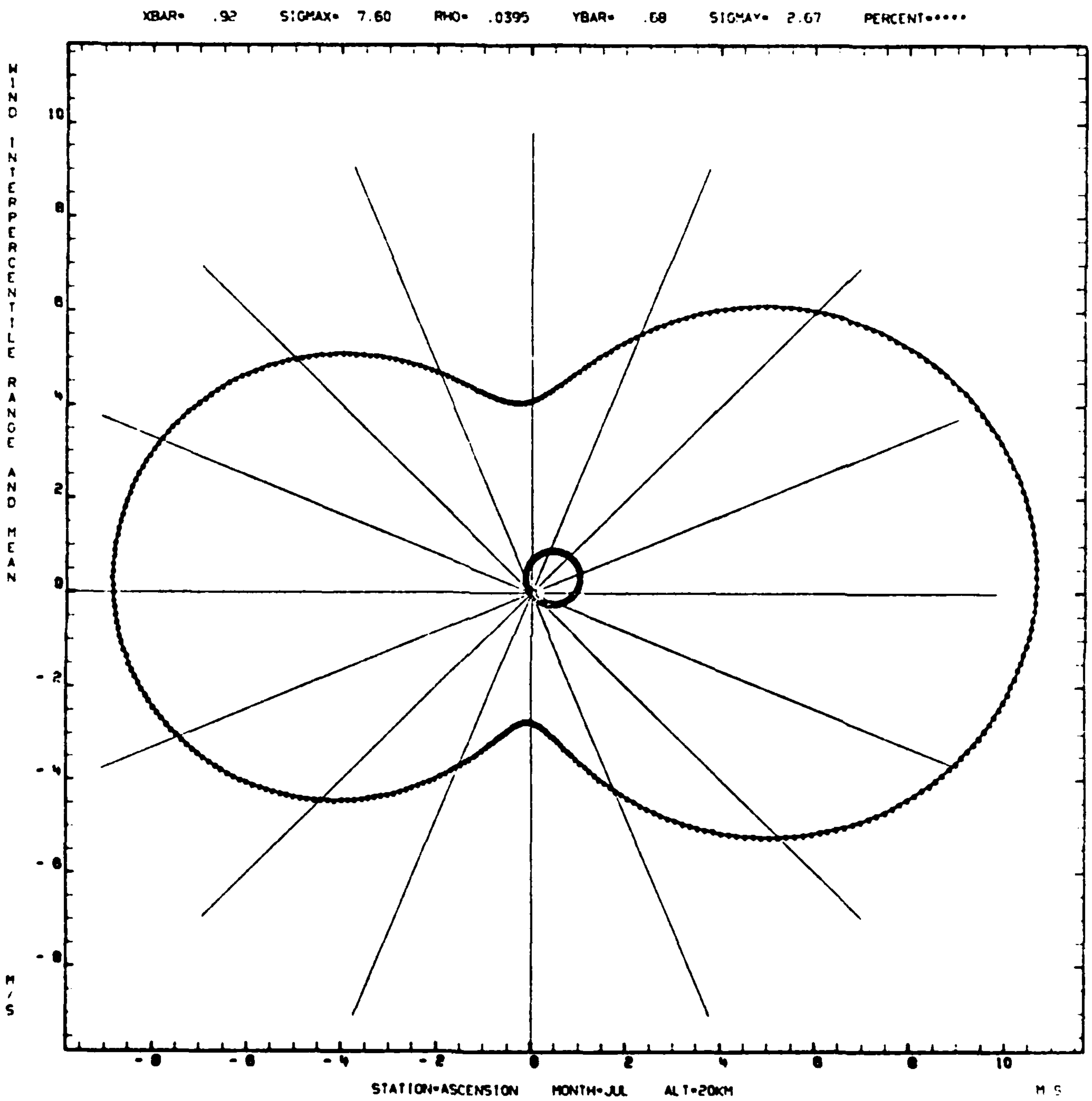

XBAR= 4.46 SIGMAX= 11.30 RHO= .2176 YBAR= -4.05 SIGMAY= 6.71 PERCENT=****
WIND INTERPERCENTILE RANGE AND MEAN
M/S
STATION=ASCENSION MONTH=JUL ALT=12KM
M/S

Figure A-26.



XBAR= .92 SIGMAX= 7.60 RHO= .0395 YBAR= .68 SIGMAY= 2.67 PERCENT=****
WIND INTERPERCENTILE RANGE AND MEAN
M/S
10
8
6
4
2
0
-2
-4
-6
-8
-8 -6 -4 -2 0 2 4 6 8 10
STATION=ASCENSION MONTH=JUL ALT=20KM
M/S

Figure A-27.

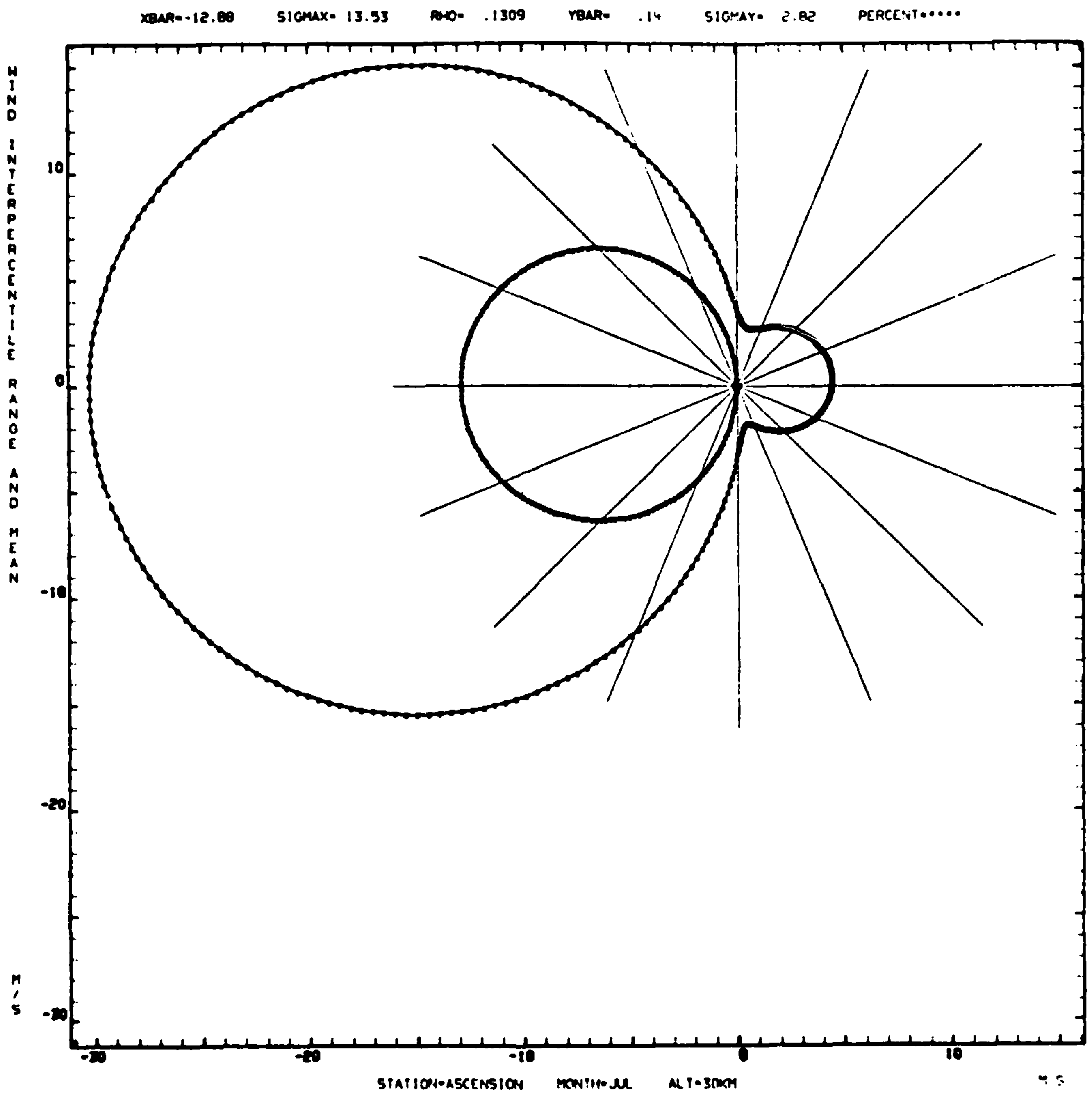
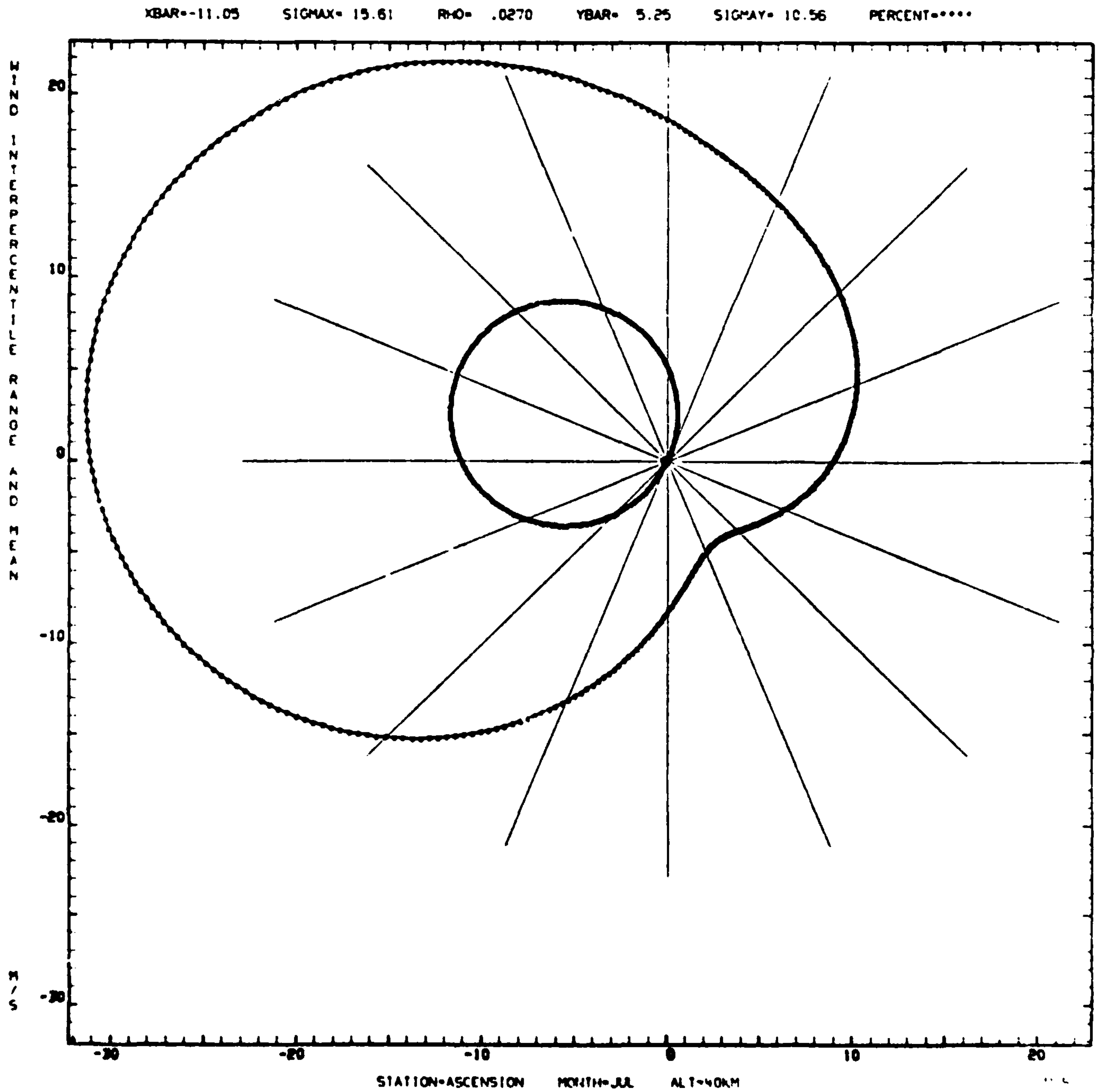
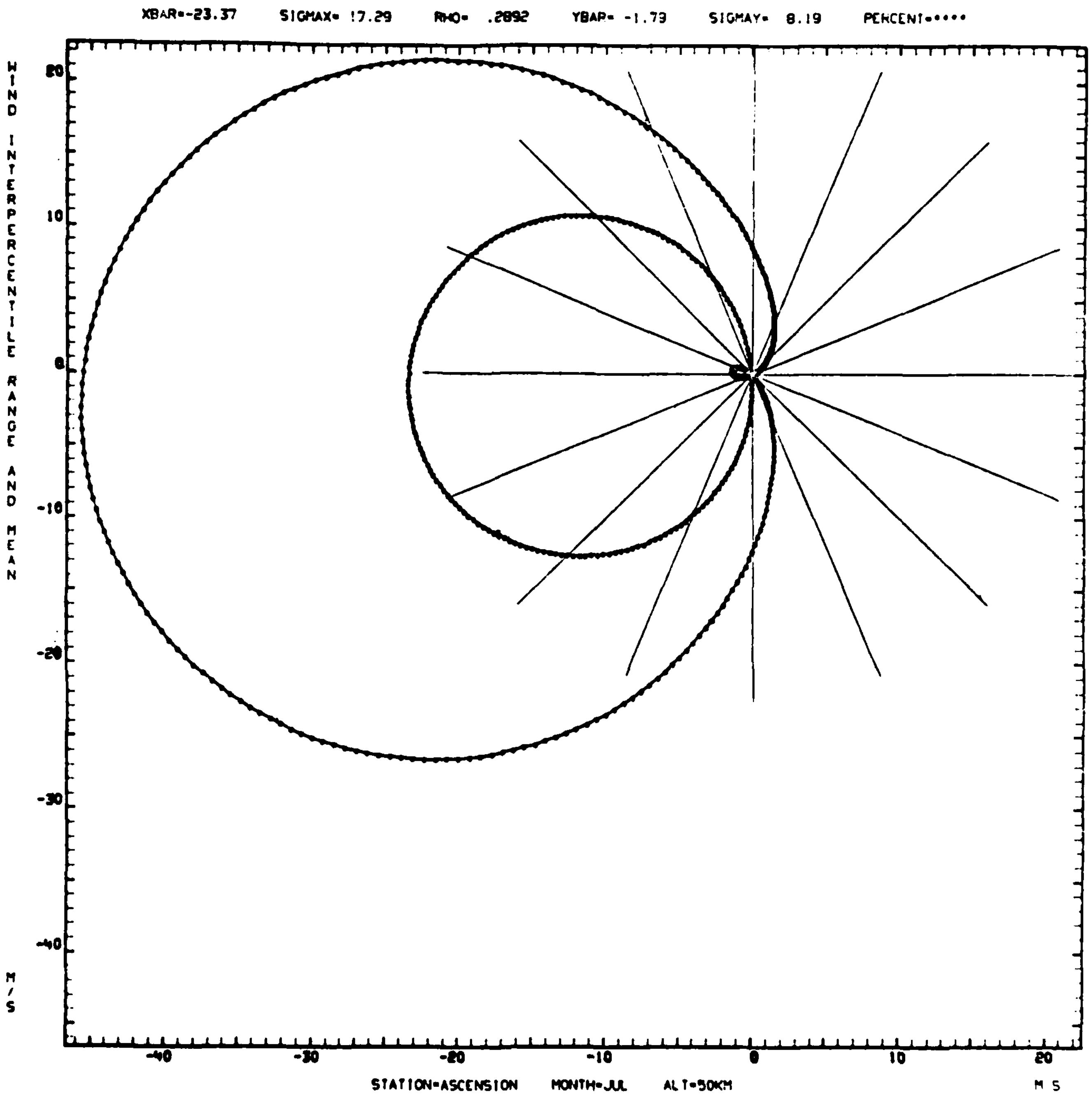

XBAR=-12.88 SIGMAX= 13.53 RHO= .1309 YBAR= .14 SIGMAY= 2.82 PERCENT=****
WIND INTERPERCENTILE RANGE AND MEAN
M/S
10
0
-10
-20
-30
-20
-10
0
10
STATION=ASCENSION MONTH=JUL ALT=30KM
M/S

Figure A-28.



XBAR=-11.05 SIGMAX= 15.61 RHO= .0270 YBAR= 5.25 SIGMAY= 10.56 PERCENT=****
WIND INTERPERCENTILE RANGE AND MEAN
M/S
20
10
0
-10
-20
-30
-30
-20
-10
0
10
20
STATION=ASCENSION MONTH=JUL ALT=40KM

Figure A-29.



XBAR=-23.37 SIGMAX= 17.29 RHO= .2892 YBAR= -1.79 SIGMAY= 8.19 PERCENT=****
WIND INTERPERCENTILE RANGE AND MEAN
M/S
20
10
0
-10
-20
-30
-40
-40
-30
-20
-10
0
10
20
STATION=ASCENSION MONTH=JUL ALT=50KM
M S

Figure A-30.

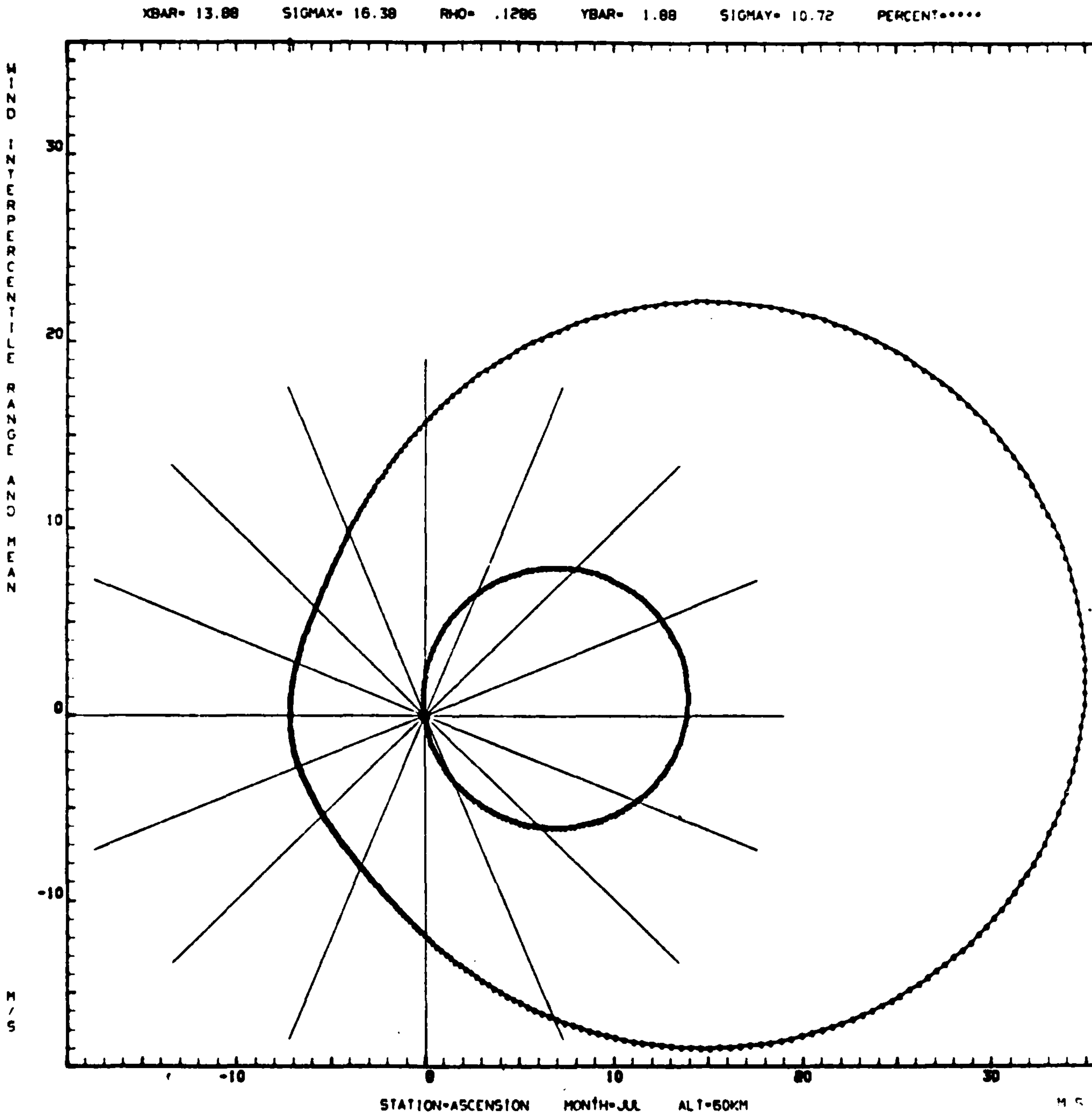

XBAR= 13.88 SIGMAX= 16.38 RHO= .1286 YBAR= 1.88 SIGMAY= 10.72 PERCENT=****
WIND INTERPERCENTILE RANGE AND MEAN
M/S
30
20
10
0
-10
-10
0
10
20
30
STATION=ASCENSION MONTH=JUL ALT=60KM
M/S

Figure A-31.

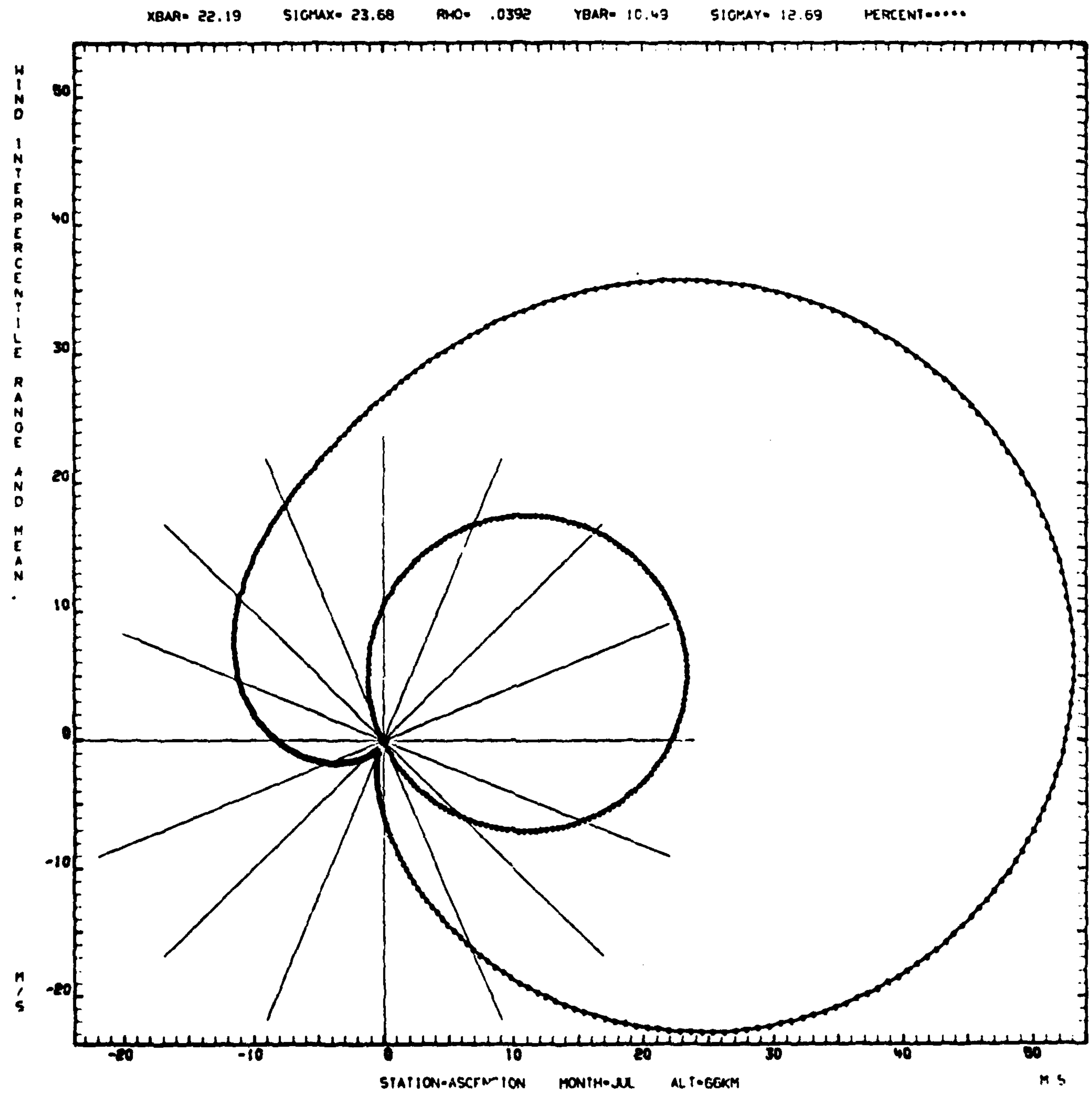
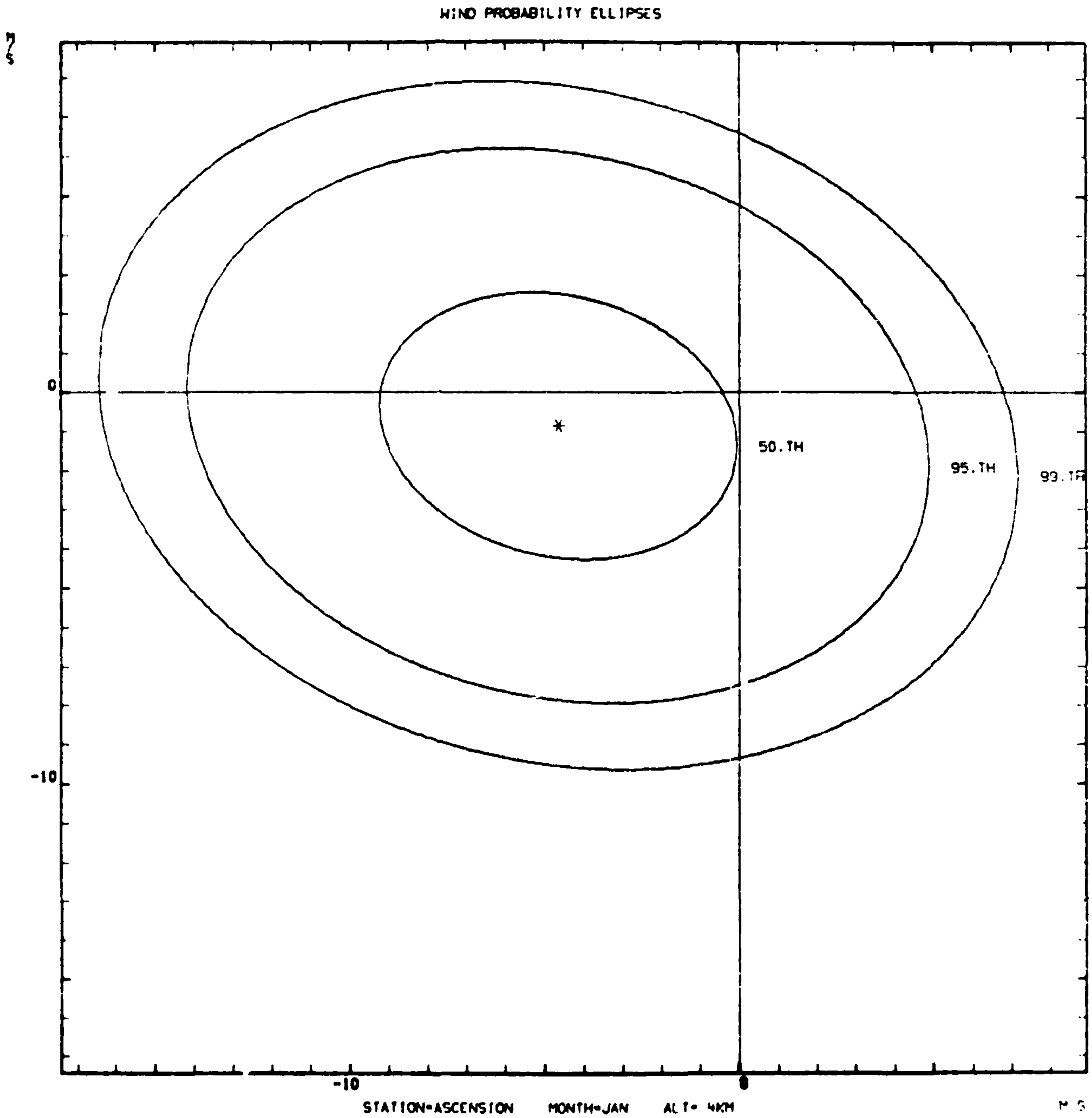

XBAR= 22.19 SIGMAX= 23.68 RHO= .0392 YBAR= 10.49 SIGMAY= 12.69 PERCENT=****
WIND INTERPERCENTILE RANGE AND MEAN.
M/S
50
40
30
20
10
0
-10
-20
-20
-10
0
10
20
30
40
50
STATION=ASCENSION MONTH=JUL ALT=66KM
M/S

Figure A-32.



WIND PROBABILITY ELLIPSES
M/S
0
-10
50.TH
95.TH
99.TH
-10
0
STATION=ASCENSION MONTH=JAN ALT= 4KM
M/S

Figure A-33.

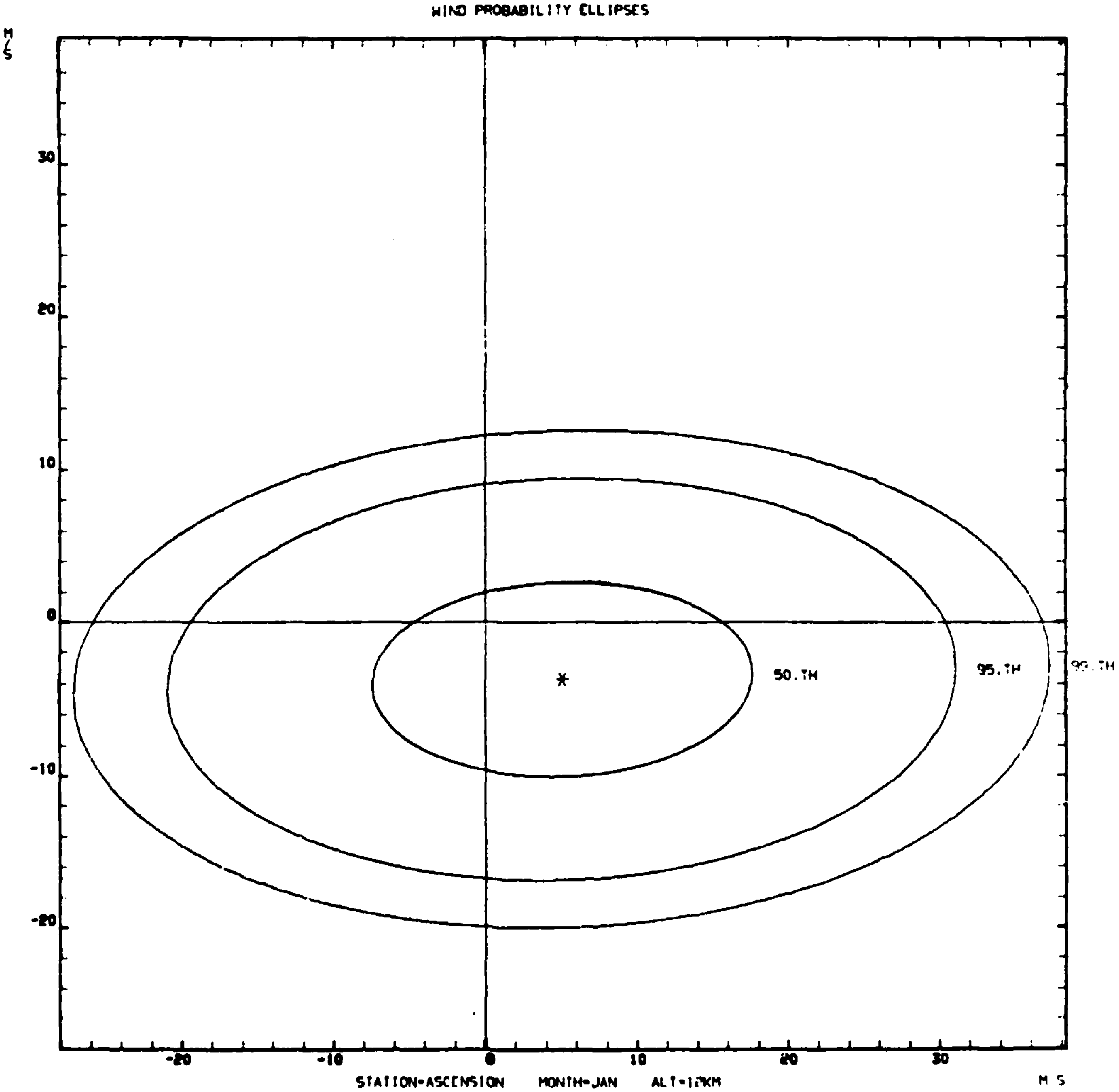

WIND PROBABILITY ELLIPSES
M/S
30
20
10
0
-10
-20
-20
-10
0
10
20
30
50.TH
95.TH
STATION=ASCENSION MONTH=JAN ALT=12KM
M S

Figure A-34.

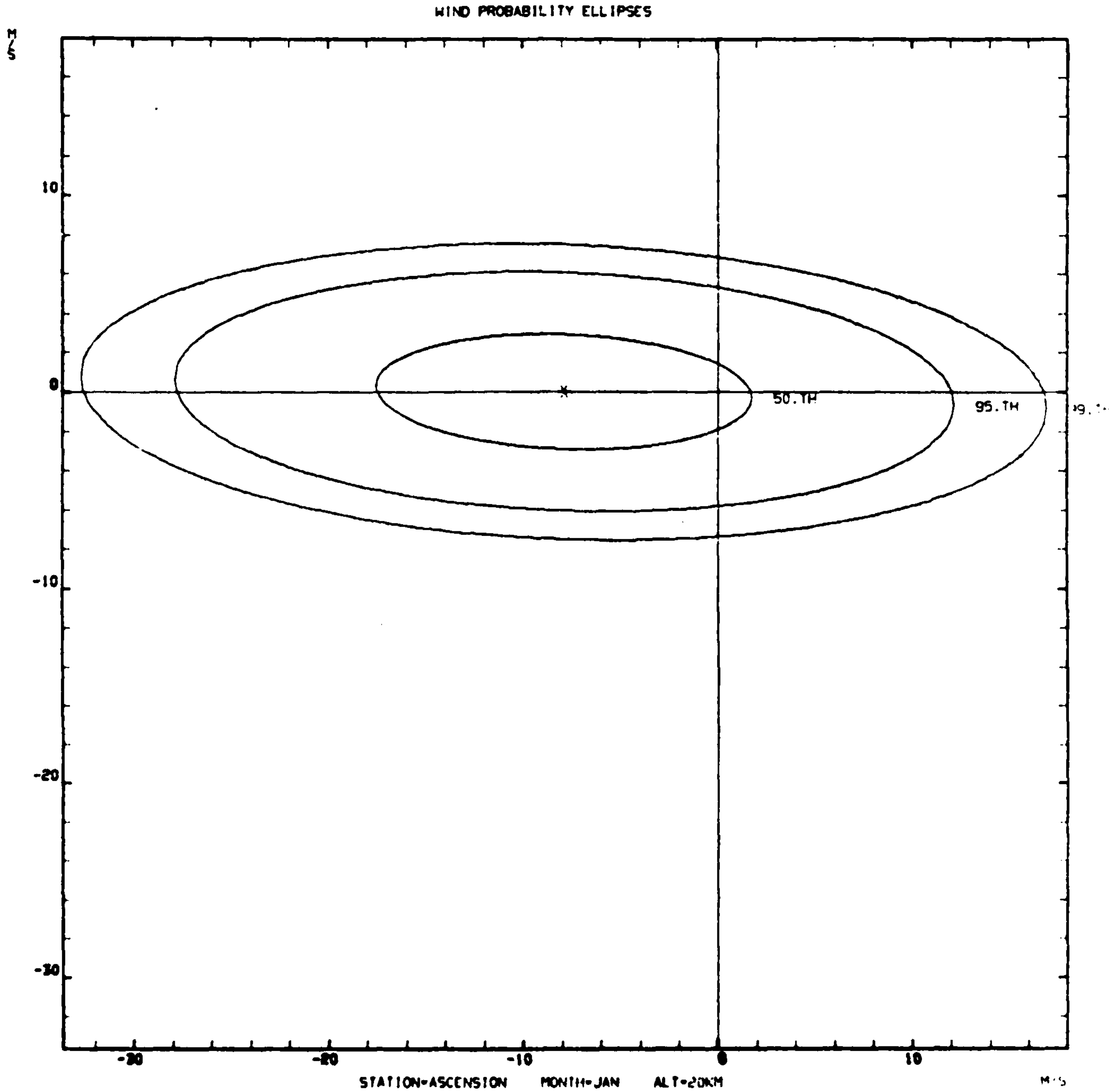

WIND PROBABILITY ELLIPSES
M/S
10
0
-10
-20
-30
50.TH
95.TH
-30
-20
-10
0
10
STATION=ASCENSION MONTH=JAN ALT=20KM

Figure A-35.

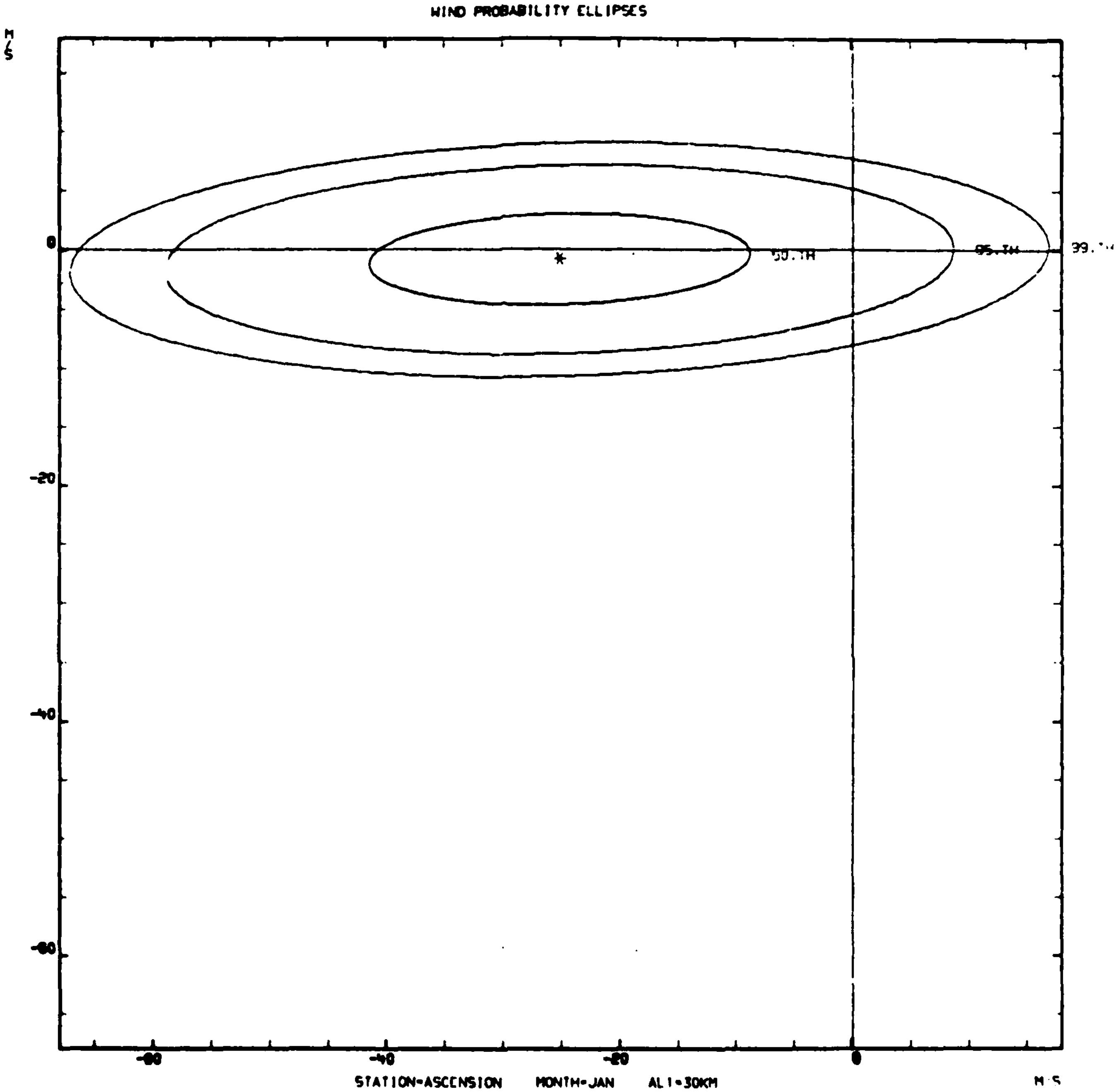

WIND PROBABILITY ELLIPSES
M/S
0
-20
-40
-60
-60
-40
-20
0
STATION=ASCENSION MONTH=JAN ALT=30KM
M/S

Figure A-36.

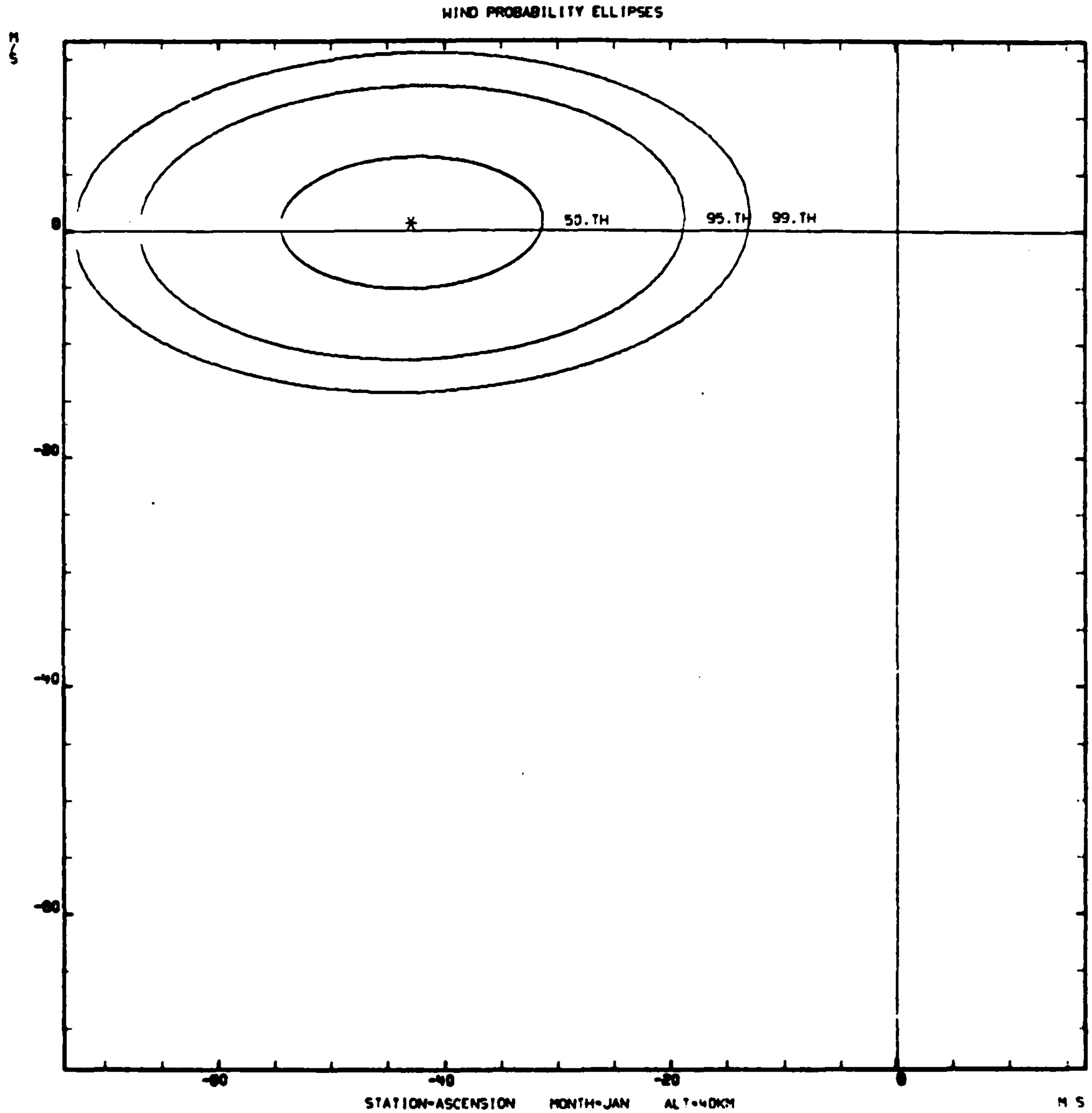

WIND PROBABILITY ELLIPSES
M/S
0
-20
-40
-60
50.TH
95.TH
99.TH
-60
-40
-20
0
STATION=ASCENSION MONTH=JAN ALT=40KM
M/S

Figure A-37.

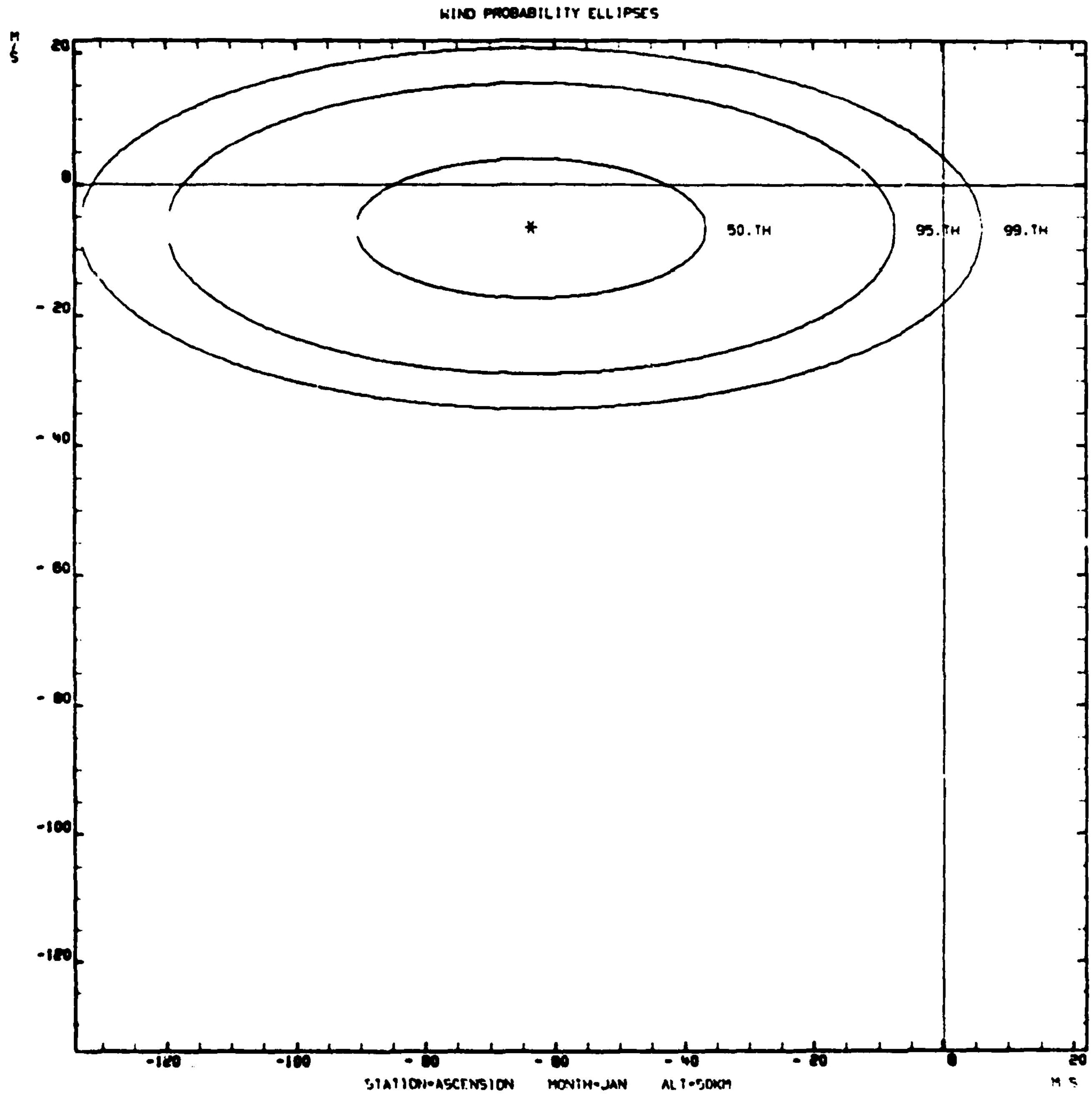

WIND PROBABILITY ELLIPSES
M/S
20
0
-20
-40
-60
-80
-100
-120
50.TH
95.TH
99.TH
-120
-100
-80
-60
-40
-20
0
20
STATION=ASCENSION MONTH=JAN ALT=50KM
M/S

Figure A-38.

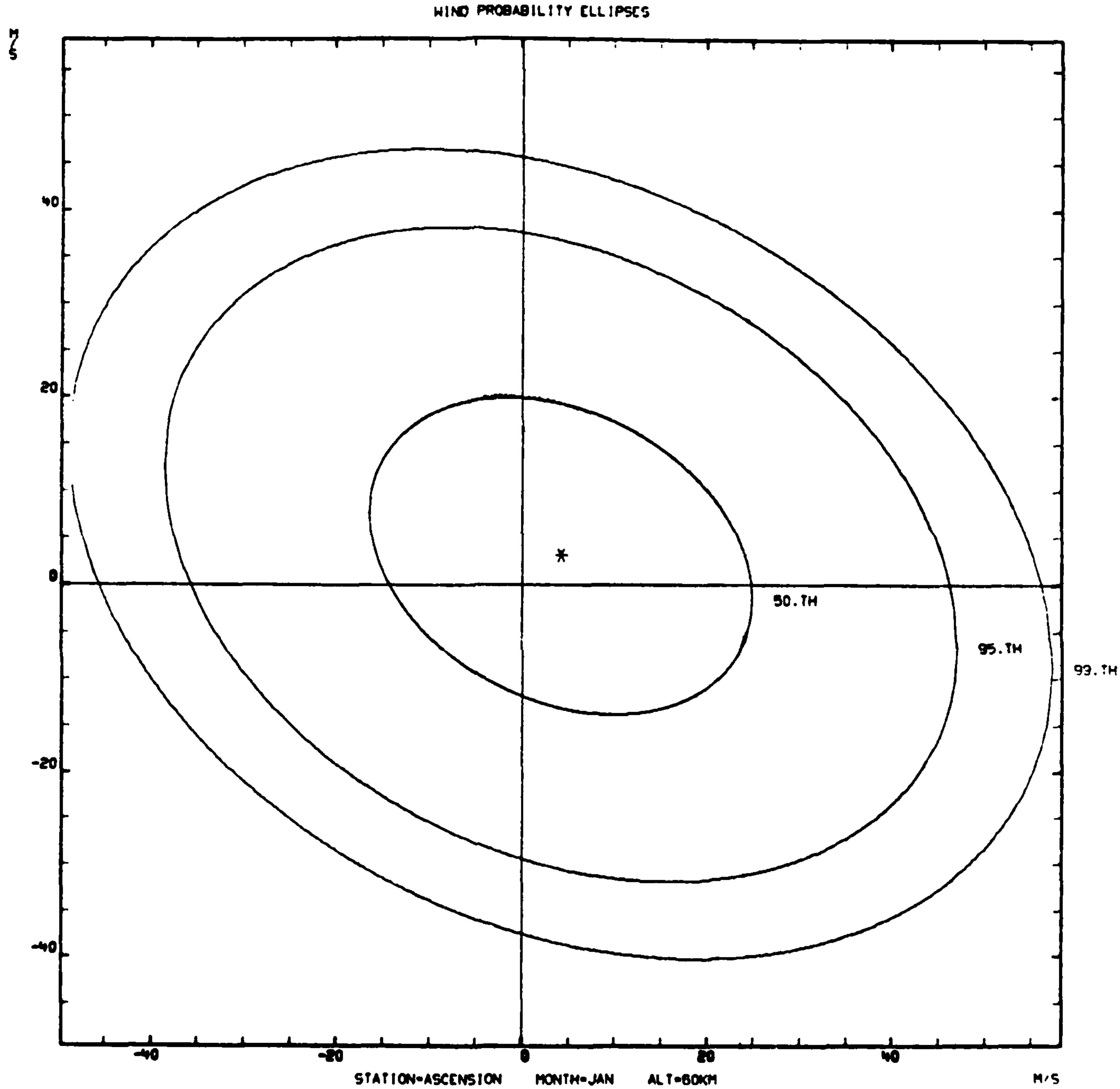

WIND PROBABILITY ELLIPSES
M/S
40
20
0
-20
-40
50.TH
95.TH
99.TH
-40
-20
0
20
40
STATION=ASCENSION MONTH=JAN ALT=60KM
M/S

Figure A-39.

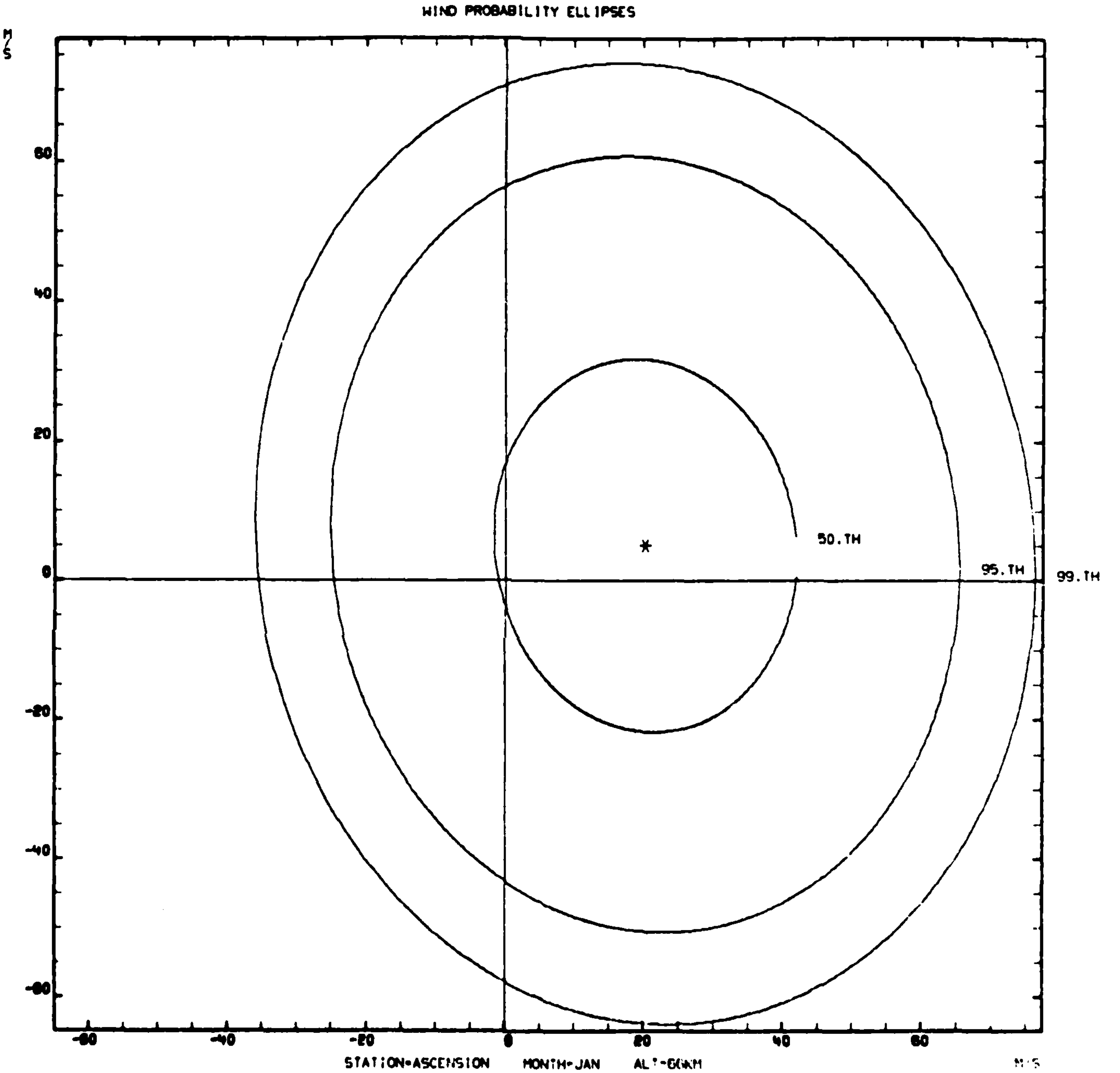
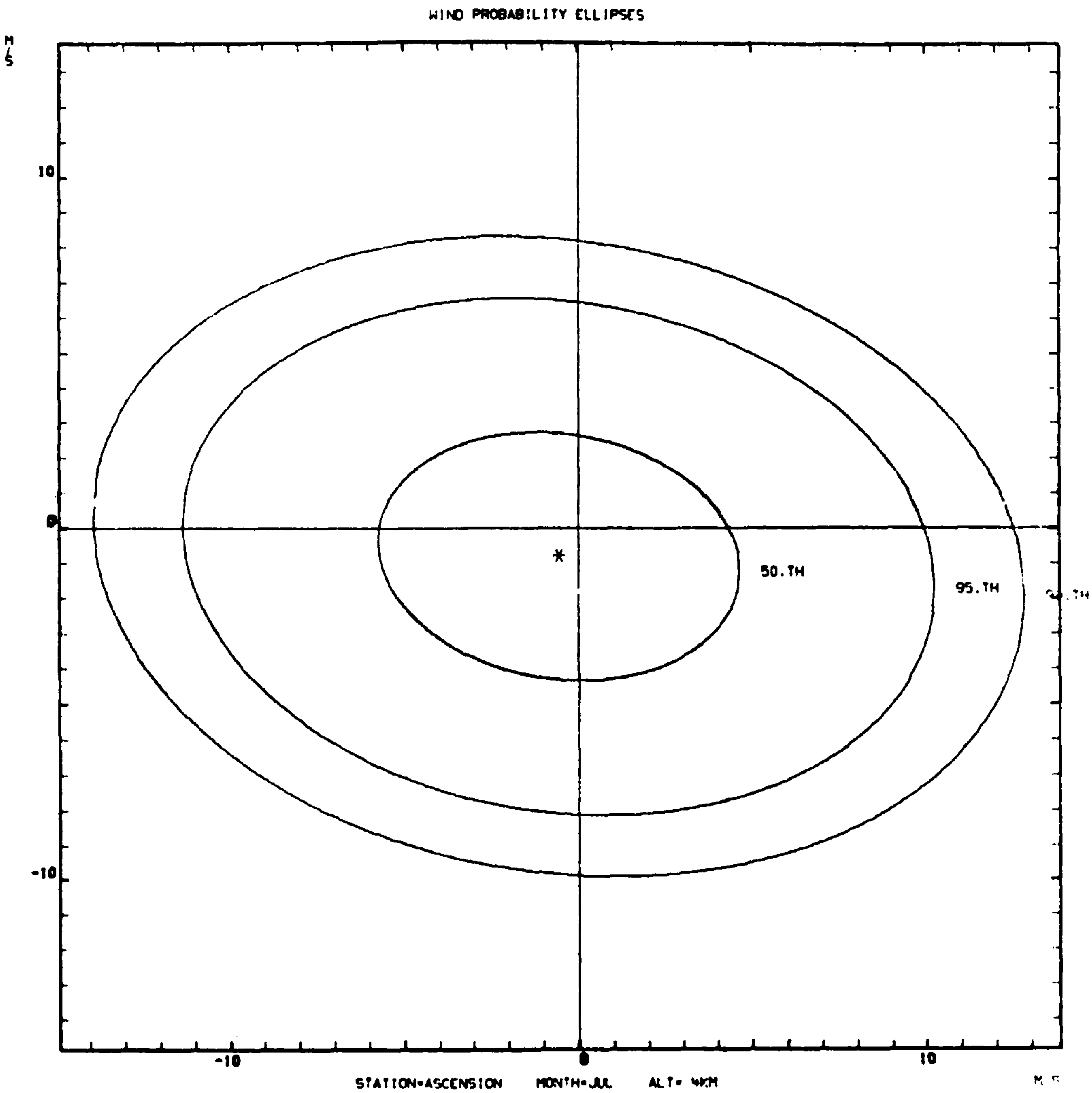

WIND PROBABILITY ELLIPSES
M/S
60
40
20
0
-20
-40
-60
50.TH
95.TH
99.TH
-60
-40
-20
0
20
40
60
STATION=ASCENSION
MONTH=JAN

Figure A-40.



WIND PROBABILITY ELLIPSES
M/S
10
0
-10
50.TH
95.TH
-10
0
10
STATION=ASCENSION MONTH=JUL ALT= 4KM

Figure A-41.

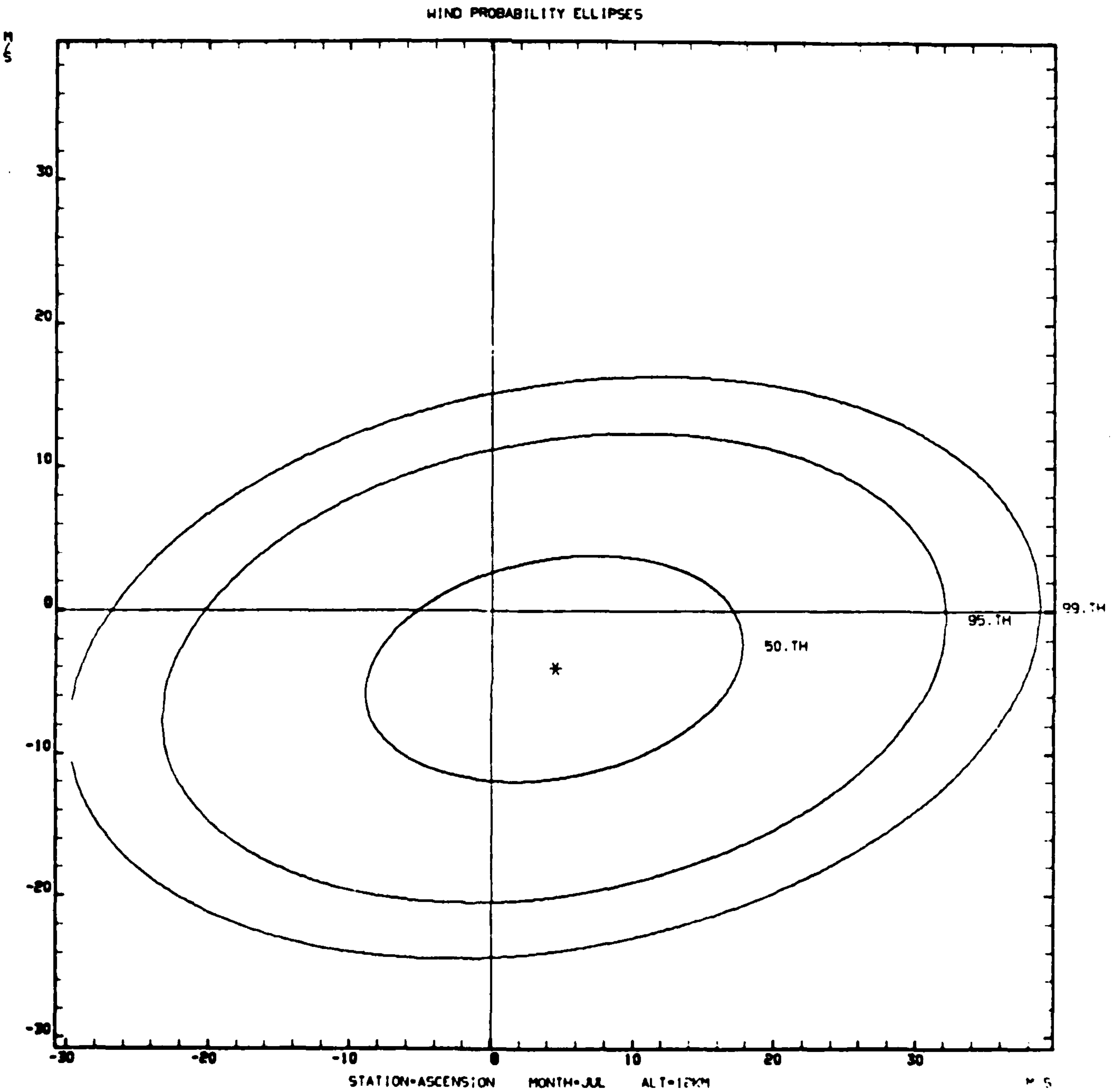
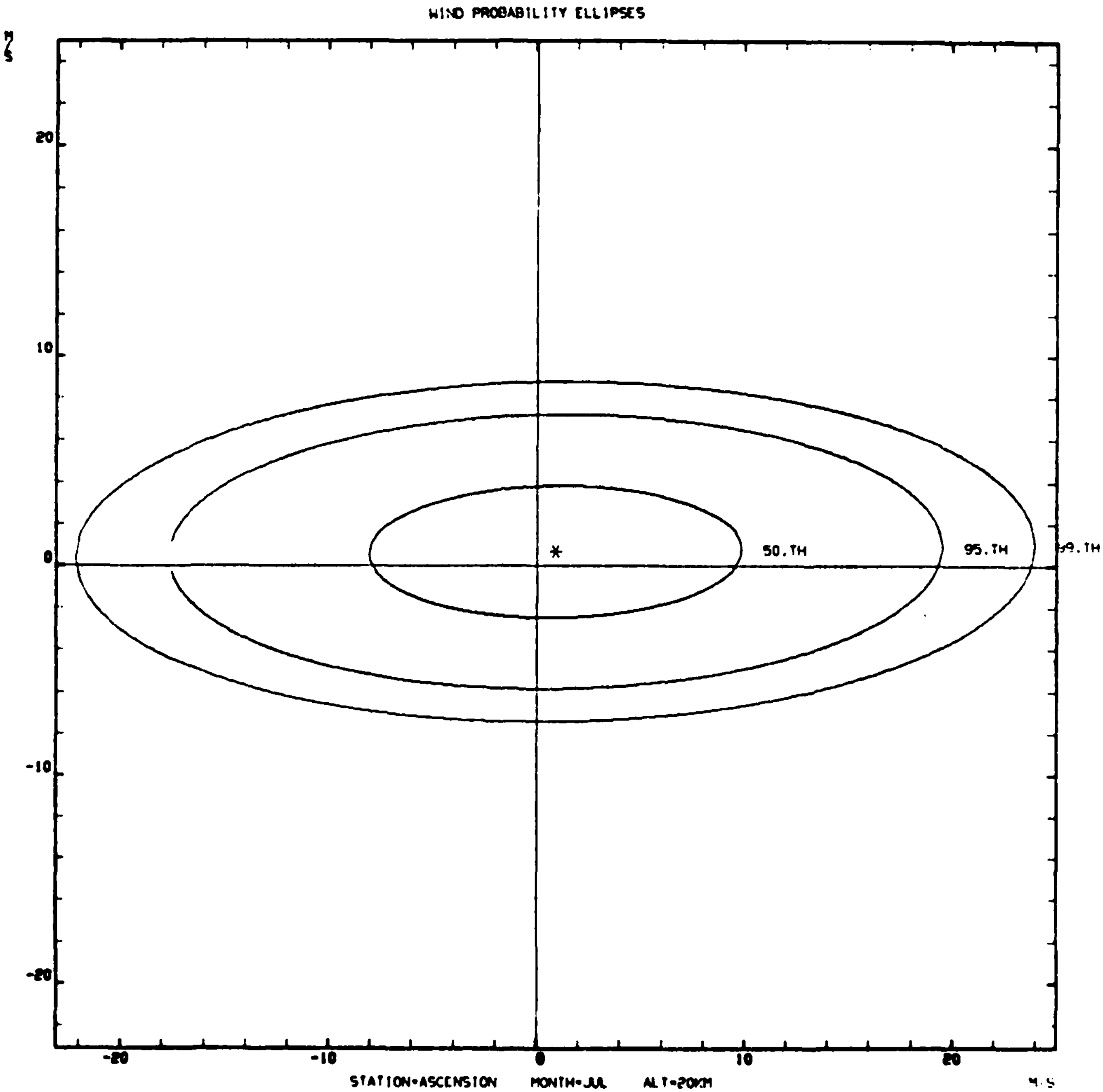

WIND PROBABILITY ELLIPSES
M/S
30
20
10
0
-10
-20
-30
-30
-20
-10
0
10
20
30
99.TH
95.TH
50.TH
STATION=ASCENSION MONTH=JUL ALT=12KM

Figure A-42.



WIND PROBABILITY ELLIPSES
M/S
20
10
0
-10
-20
-20
-10
0
10
20
50.TH
95.TH
99.TH
STATION=ASCENSION MONTH=JUL ALT=20KM
M/S

Figure A-43.

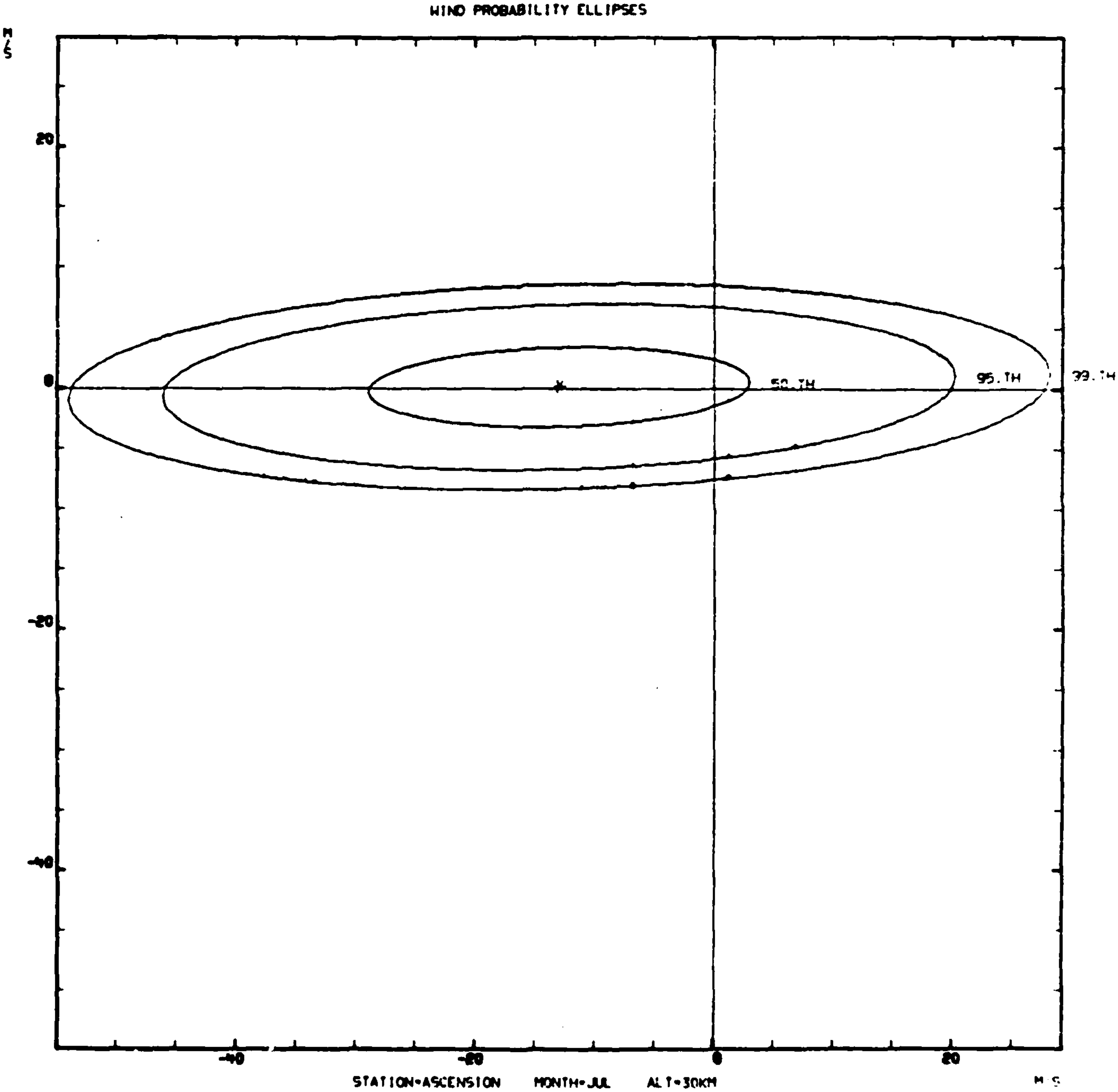
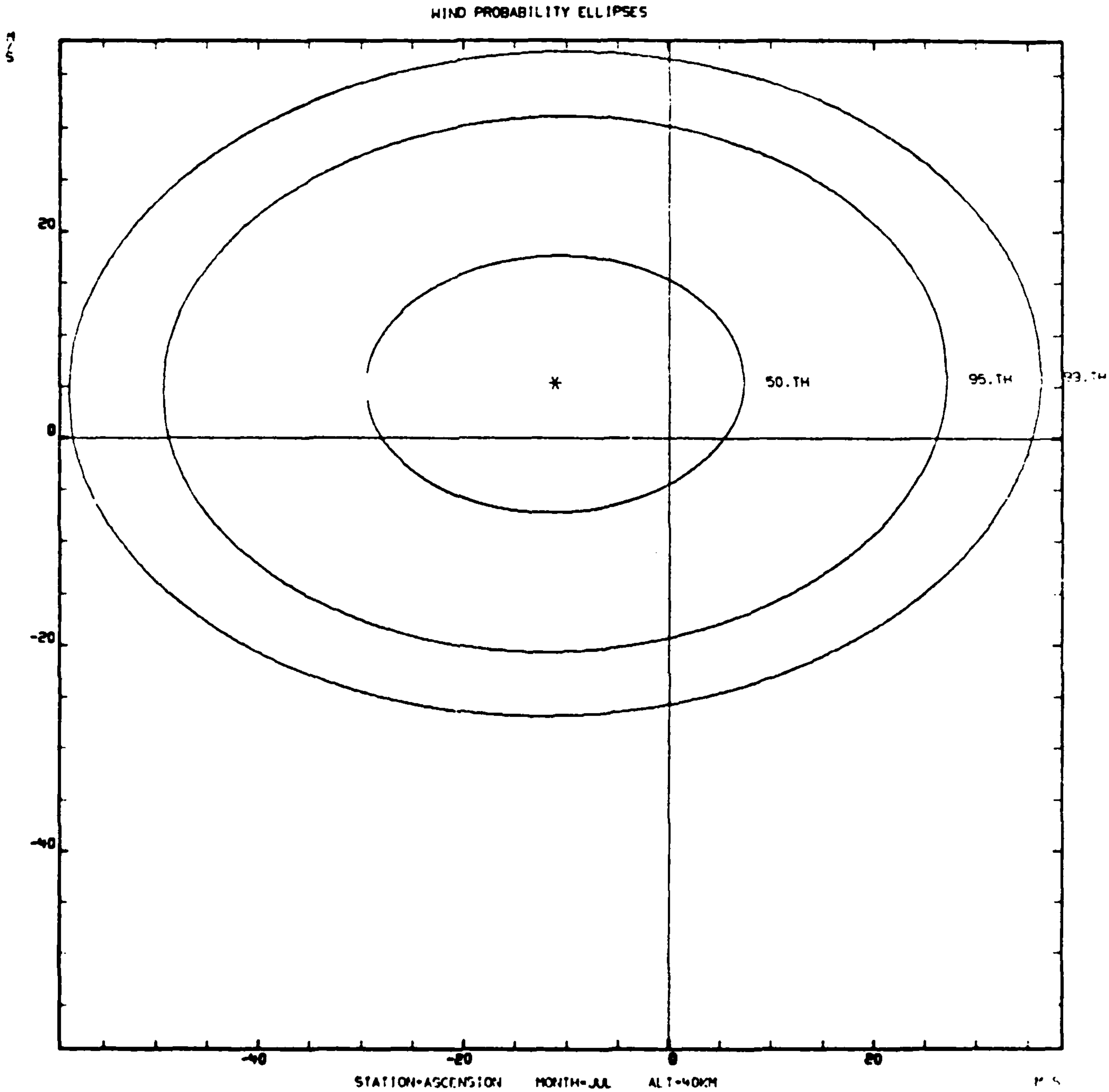
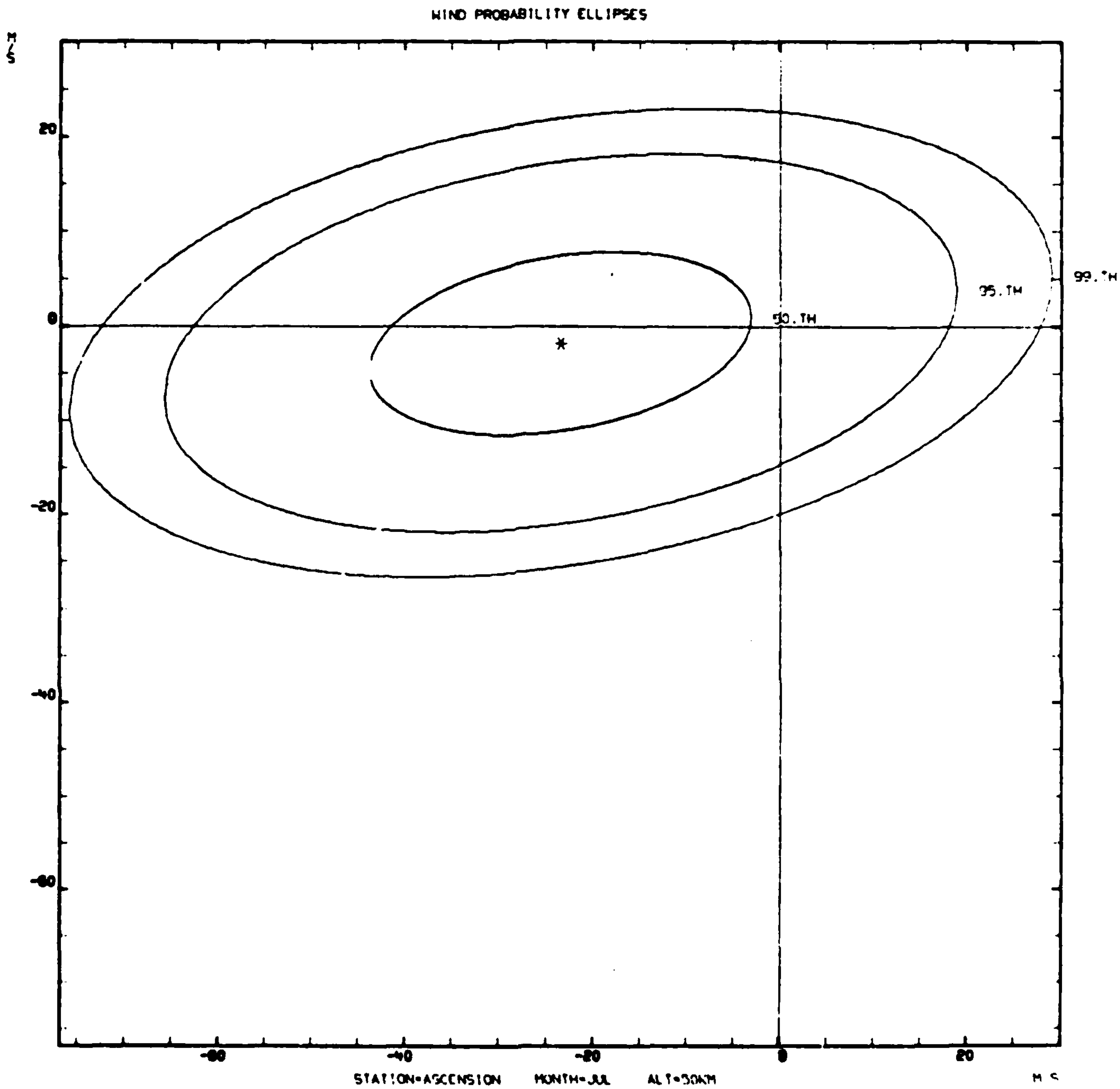

WIND PROBABILITY ELLIPSES
M/S
20
0
-20
-40
50.TH
95.TH
99.TH
-40
-20
0
20
M/S
STATION=ASCENSION MONTH=JUL ALT=30KM

Figure A-44.



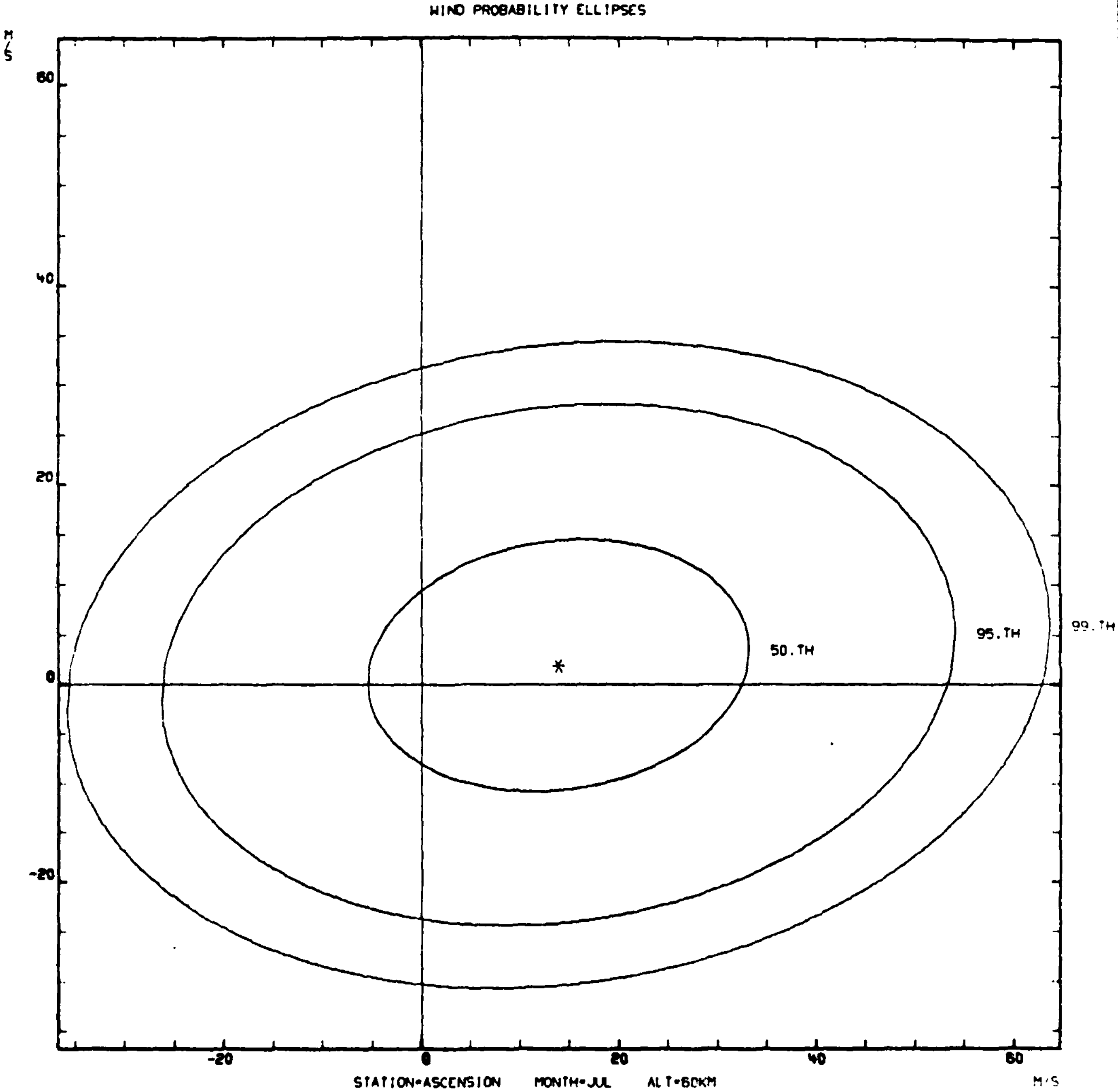
WIND PROBABILITY ELLIPSES
M/S
20
0
-20
-40
50.TH
95.TH
99.TH
-40
-20
0
20
STATION=ASCENSION MONTH=JUL ALT=40KM
M/S

Figure A-45.



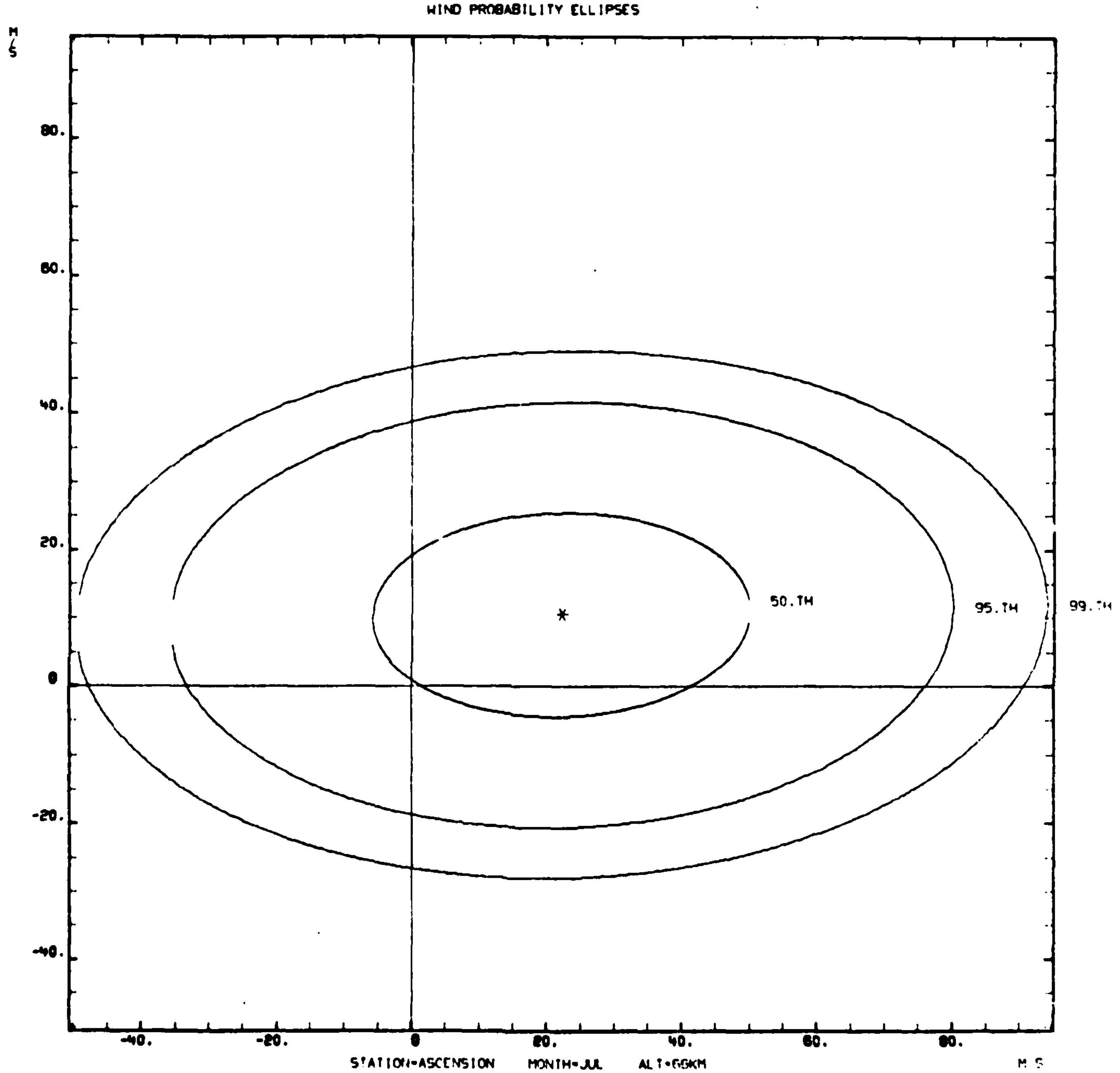
WIND PROBABILITY ELLIPSES
M/S
20
0
-20
-40
-60
99.TH
95.TH
50.TH
-60
-40
-20
0
20
M/S
STATION=ASCENSION MONTH=JUL ALT=30KM

Figure A-46.



WIND PROBABILITY ELLIPSES
M/S
60
40
20
0
-20
-20
0
20
40
60
M/S
50.TH
95.TH
99.TH
STATION=ASCENSION MONTH=JUL ALT=60KM

Figure A-47.



WIND PROBABILITY ELLIPSES
M/S
80.
60.
40.
20.
0
-20.
-40.
50.TH
95.TH
-40.
-20.
0
20.
40.
60.
80.
STATION=ASCENSION
MONTH=JUL

Figure A-48.

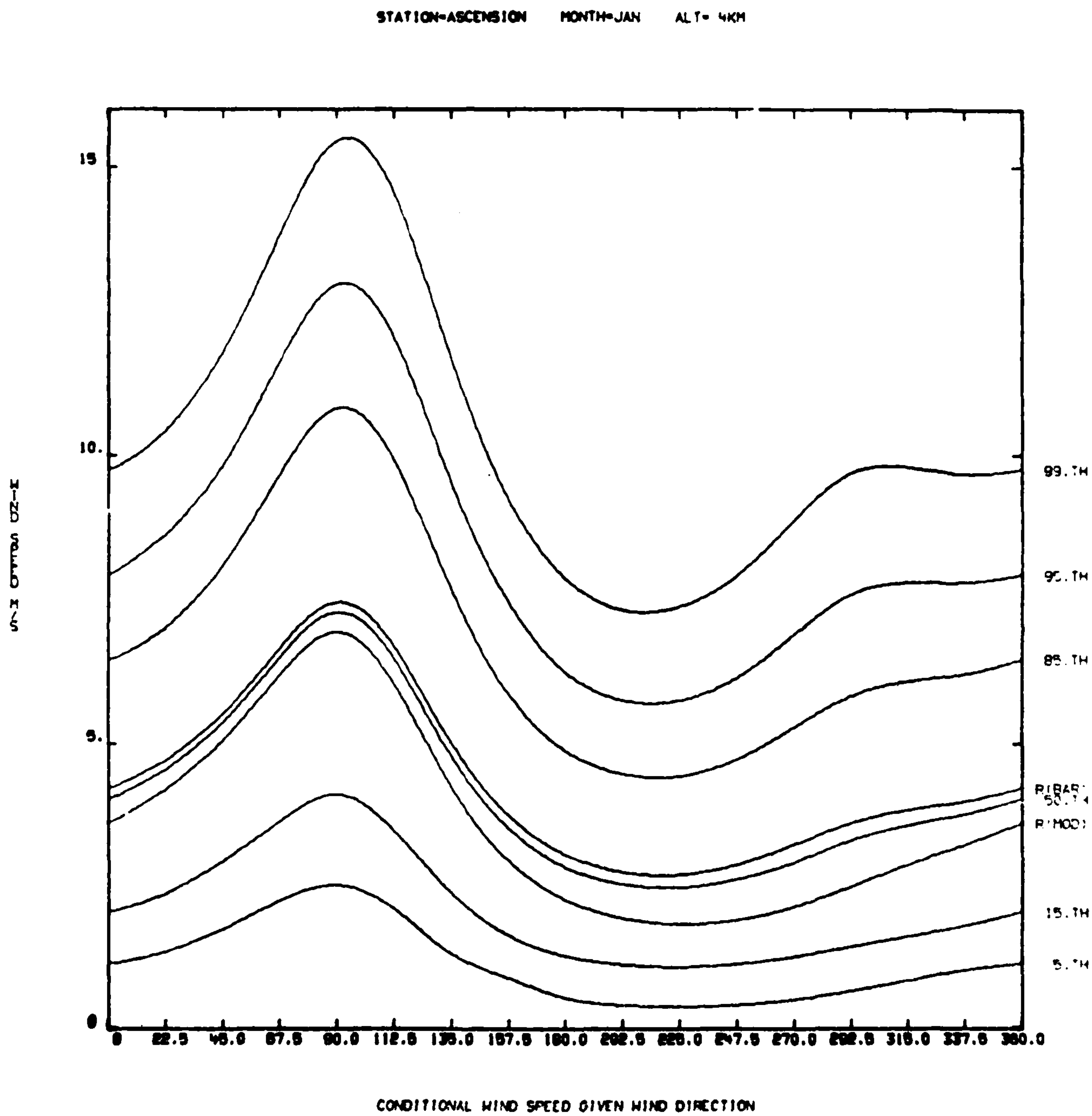
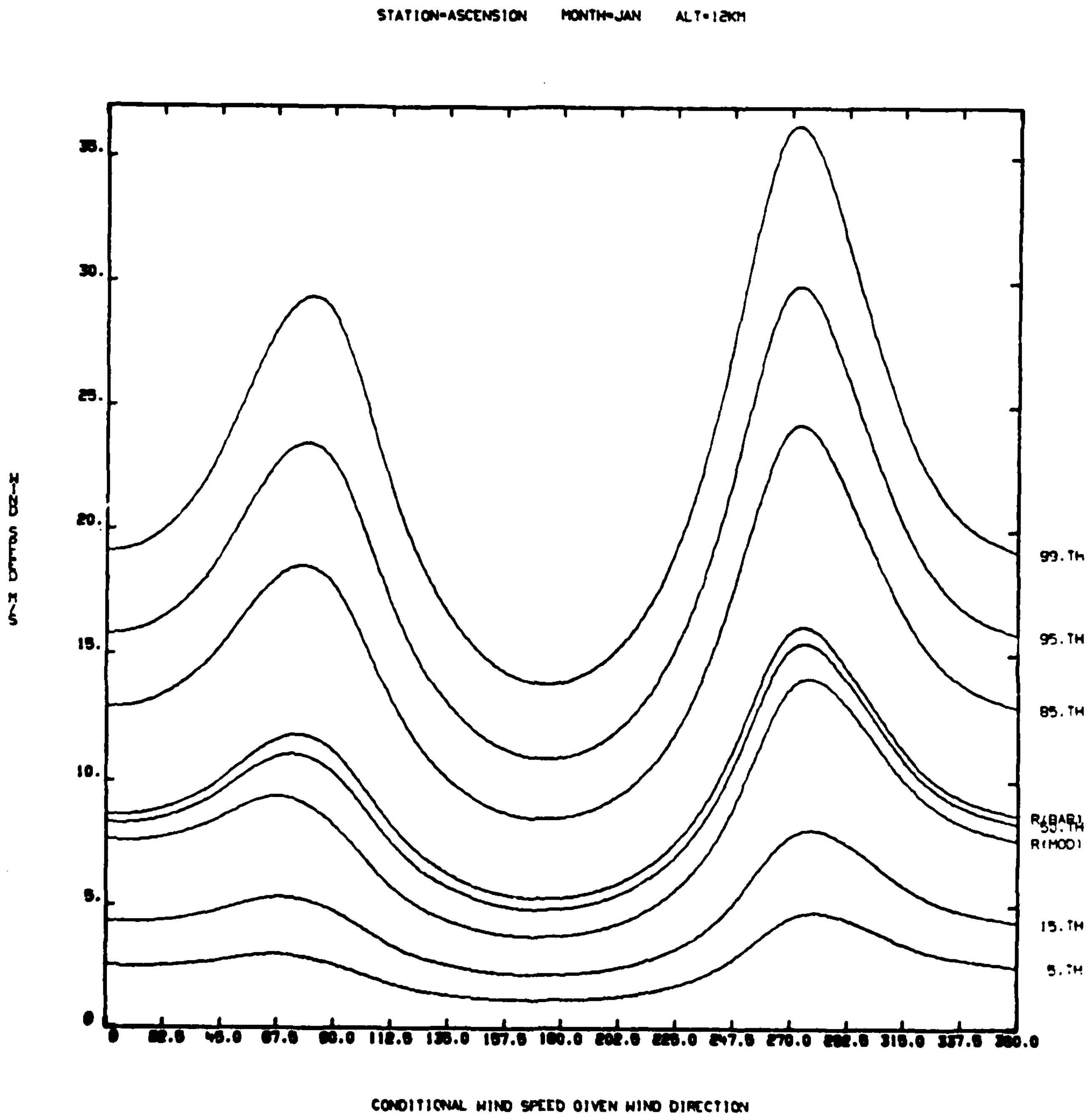
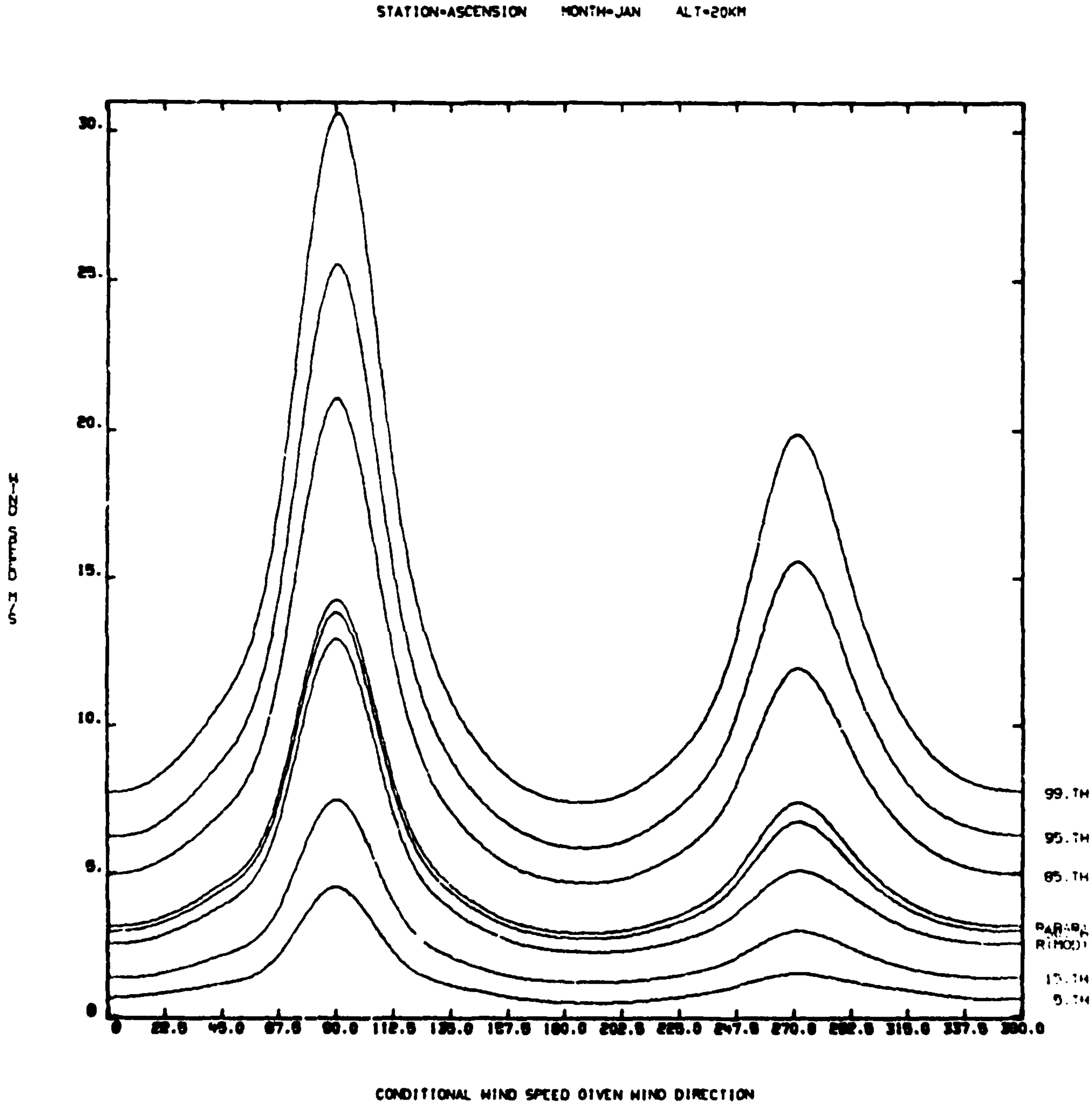

STATION=ASCENSION MONTH=JAN ALT= 4KM
15
10.
5.
0
WIND SPEED M/S
99.TH
95.TH
85.TH
R(BAR)
50.TH
R(MOD)
15.TH
5.TH
0 22.5 45.0 67.5 90.0 112.5 135.0 157.5 180.0 202.5 225.0 247.5 270.0 292.5 315.0 337.5 360.0
CONDITIONAL WIND SPEED GIVEN WIND DIRECTION

Figure A-49.



STATION=ASCENSION MONTH=JAN ALT=12KM
WIND SPEED M/S
CONDITIONAL WIND SPEED GIVEN WIND DIRECTION
99.TH
95.TH
85.TH
R(BAR)
50.TH
R(MOD)
15.TH
5.TH

Figure A-50.



STATION=ASCENSION MONTH=JAN ALT=20KM
WIND SPEED M/S
CONDITIONAL WIND SPEED GIVEN WIND DIRECTION
99.TH
95.TH
85.TH

Figure A-51.

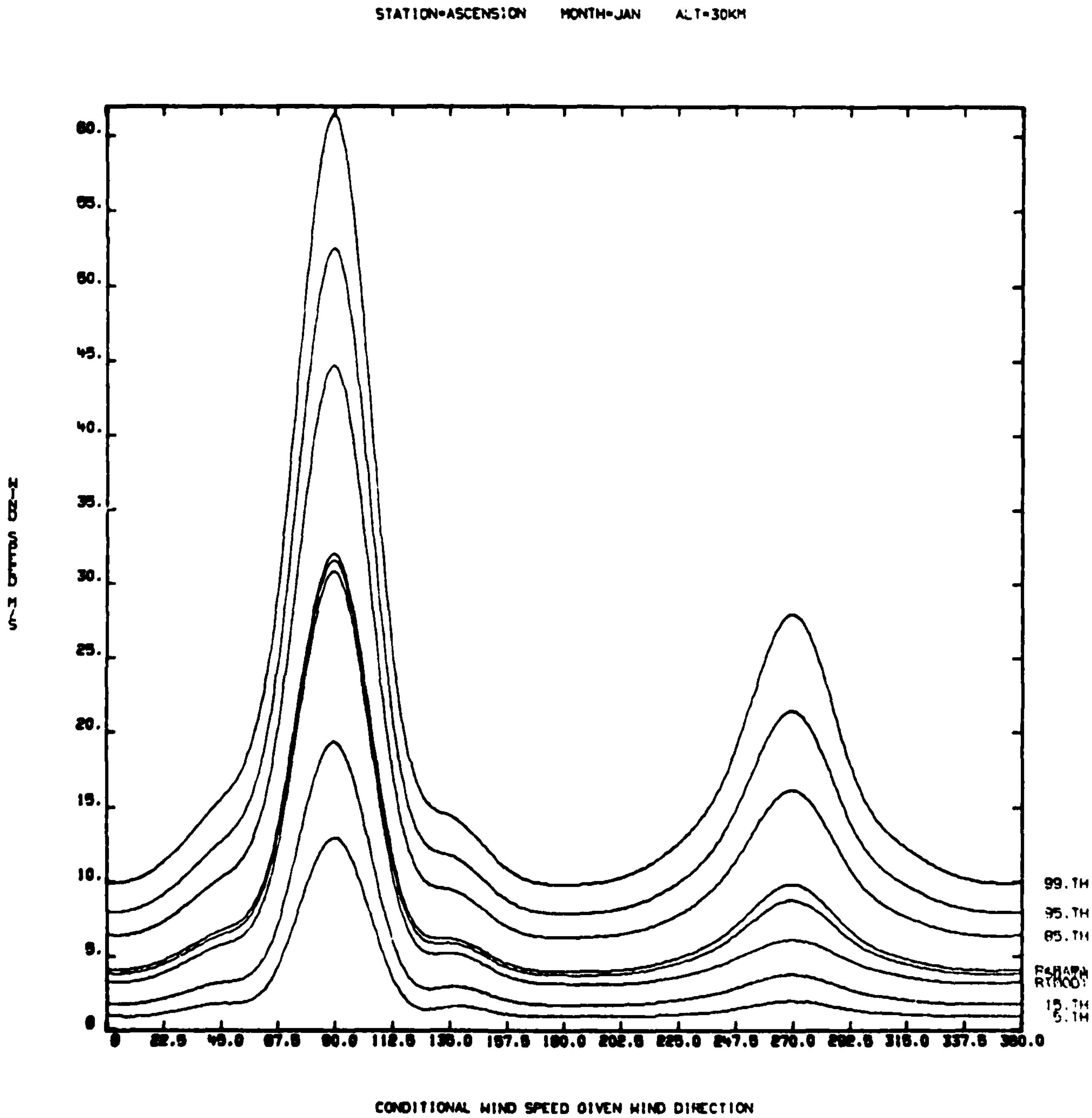
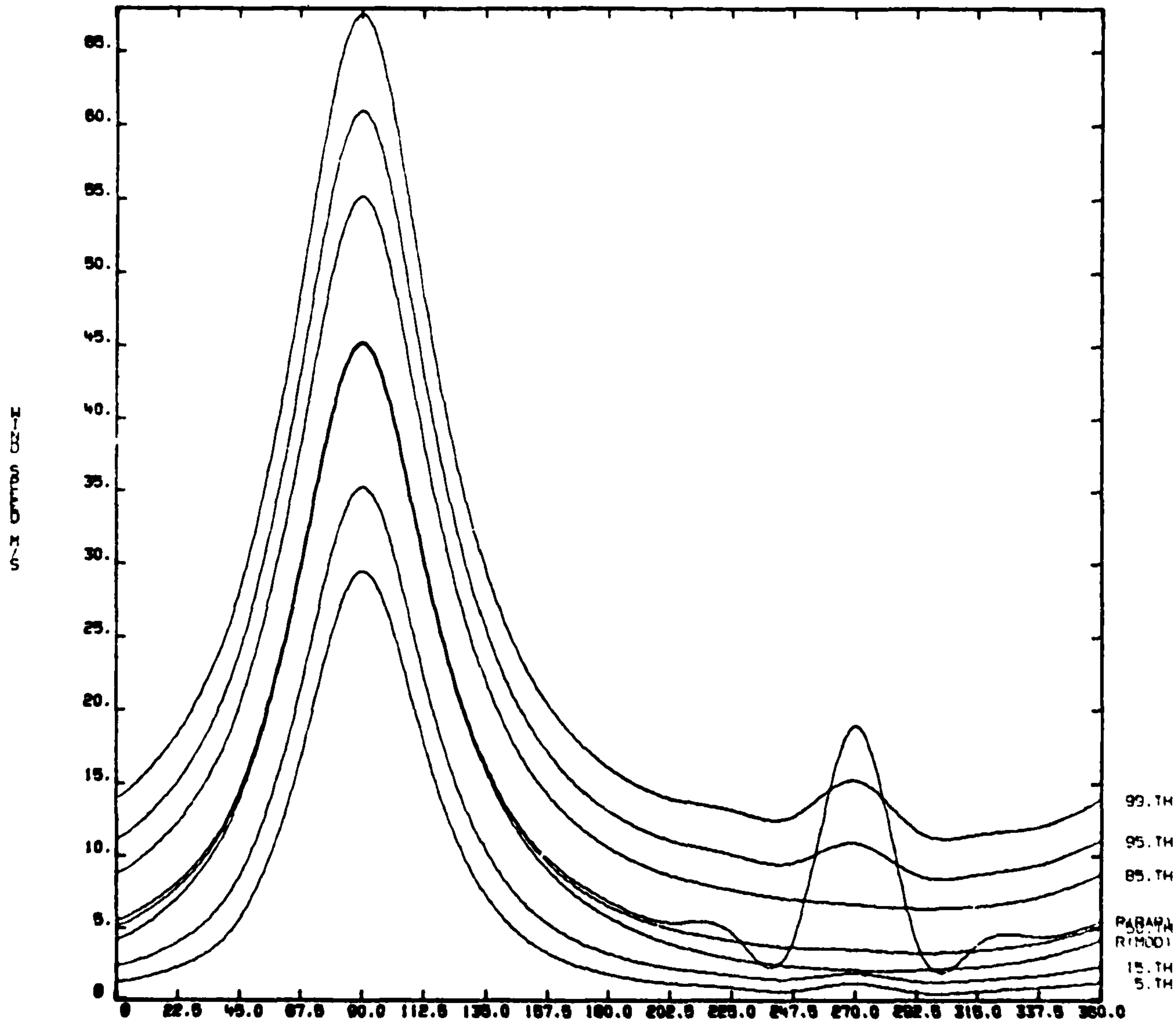

STATION=ASCENSION MONTH=JAN ALT=30KM
WIND SPEED M/S
CONDITIONAL WIND SPEED GIVEN WIND DIRECTION
99.TH
95.TH
85.TH
15.TH
5.TH
0
22.5
45.0
67.5
90.0
112.5
135.0
157.5
180.0
202.5
225.0
247.5
270.0
292.5
315.0
337.5
360.0

Figure A-52.

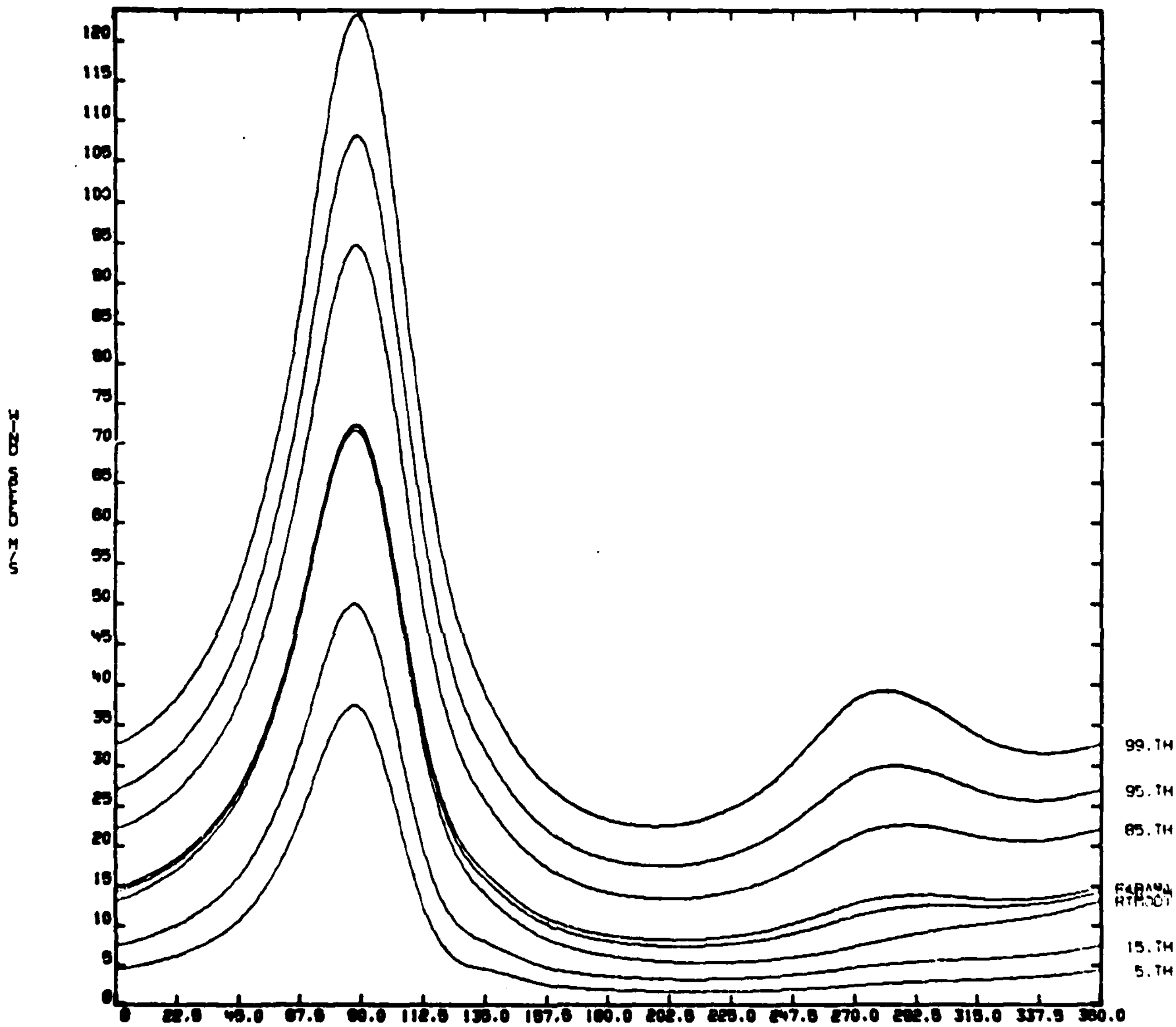
STATION=ASCENSION MONTH=JAN ALT=40KM



CONDITIONAL WIND SPEED GIVEN WIND DIRECTION

Figure A-53.

STATION=ASCENSION   MONTH=JAN   ALT=50KM



CONDITIONAL WIND SPEED GIVEN WIND DIRECTION

Figure A-54.

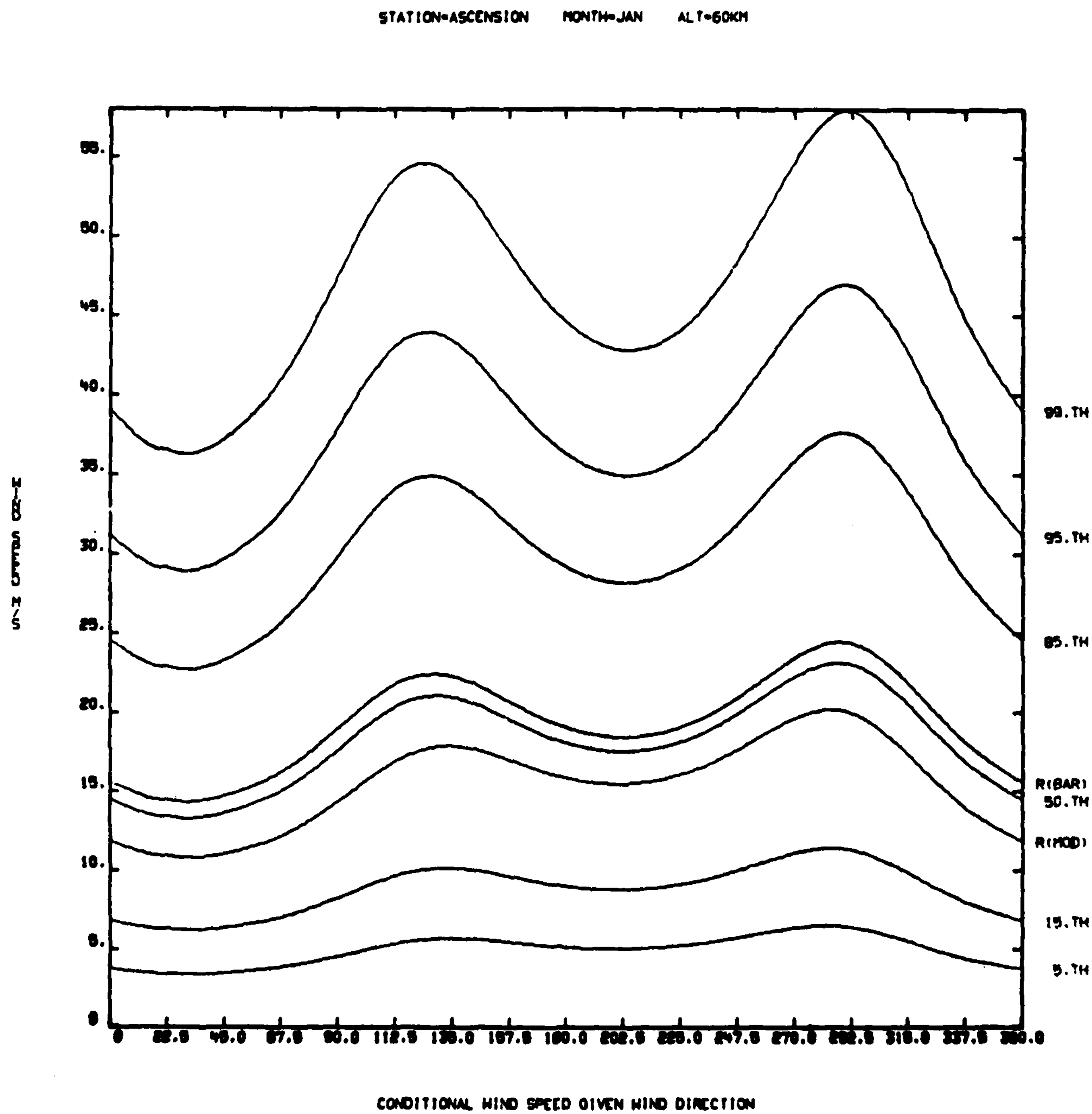

STATION=ASCENSION MONTH=JAN ALT=60KM
WIND SPEED M/S
55.
50.
45.
40.
35.
30.
25.
20.
15.
10.
5.
0
0
22.5
45.0
67.5
90.0
112.5
135.0
157.5
180.0
202.5
225.0
247.5
270.0
292.5
315.0
337.5
360.0
99.TH
95.TH
85.TH
R(BAR)
50.TH
R(MOD)
15.TH
5.TH
CONDITIONAL WIND SPEED GIVEN WIND DIRECTION

Figure A-55.

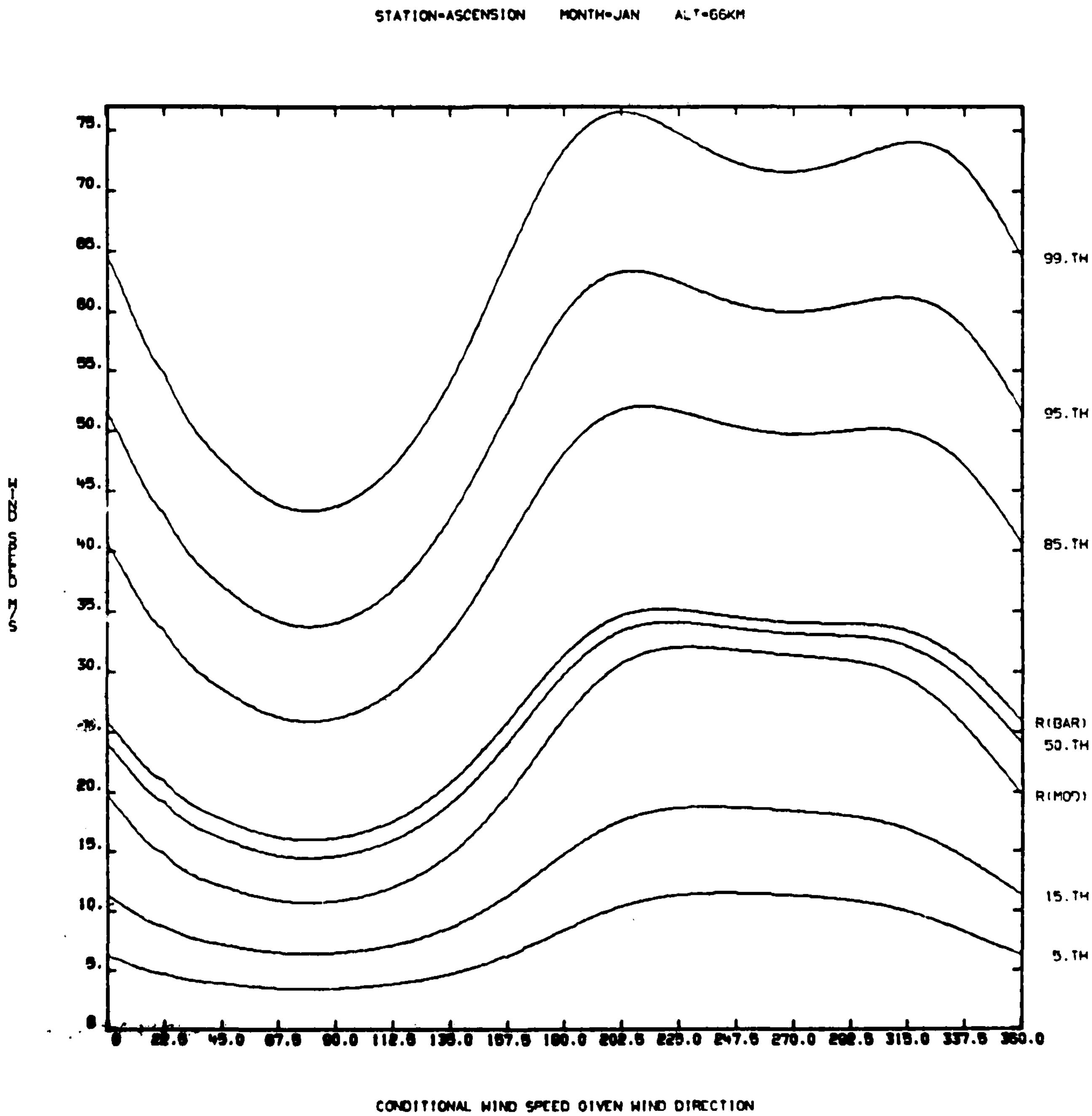

STATION=ASCENSION MONTH=JAN ALT=66KM
75.
70.
65.
60.
55.
50.
45.
40.
35.
30.
25.
20.
15.
10.
5.
0.
WIND SPEED M/S
0
22.5
45.0
67.5
90.0
112.5
135.0
157.5
180.0
202.5
225.0
247.5
270.0
292.5
315.0
337.5
360.0
CONDITIONAL WIND SPEED GIVEN WIND DIRECTION
99.TH
95.TH
85.TH
R(BAR)
50.TH
R(MOD)
15.TH
5.TH

Figure A-56.

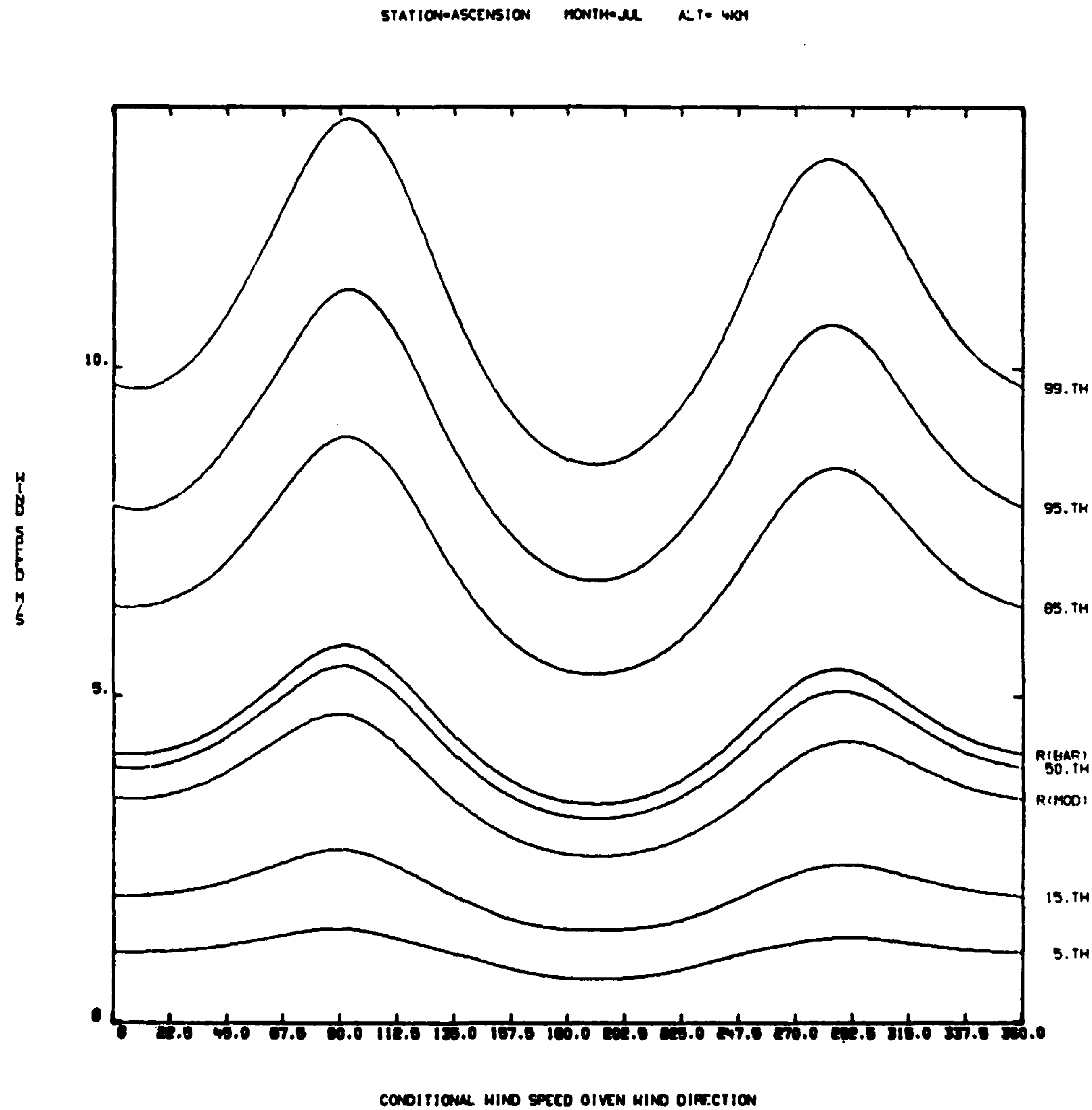

STATION=ASCENSION MONTH=JUL ALT= 4KM
WIND SPEED M/S
10.
5.
0
0 22.5 45.0 67.5 90.0 112.5 135.0 157.5 180.0 202.5 225.0 247.5 270.0 292.5 315.0 337.5 360.0
99.TH
95.TH
85.TH
R(BAR)
50.TH
R(MOD)
15.TH
5.TH
CONDITIONAL WIND SPEED GIVEN WIND DIRECTION

Figure A-57.

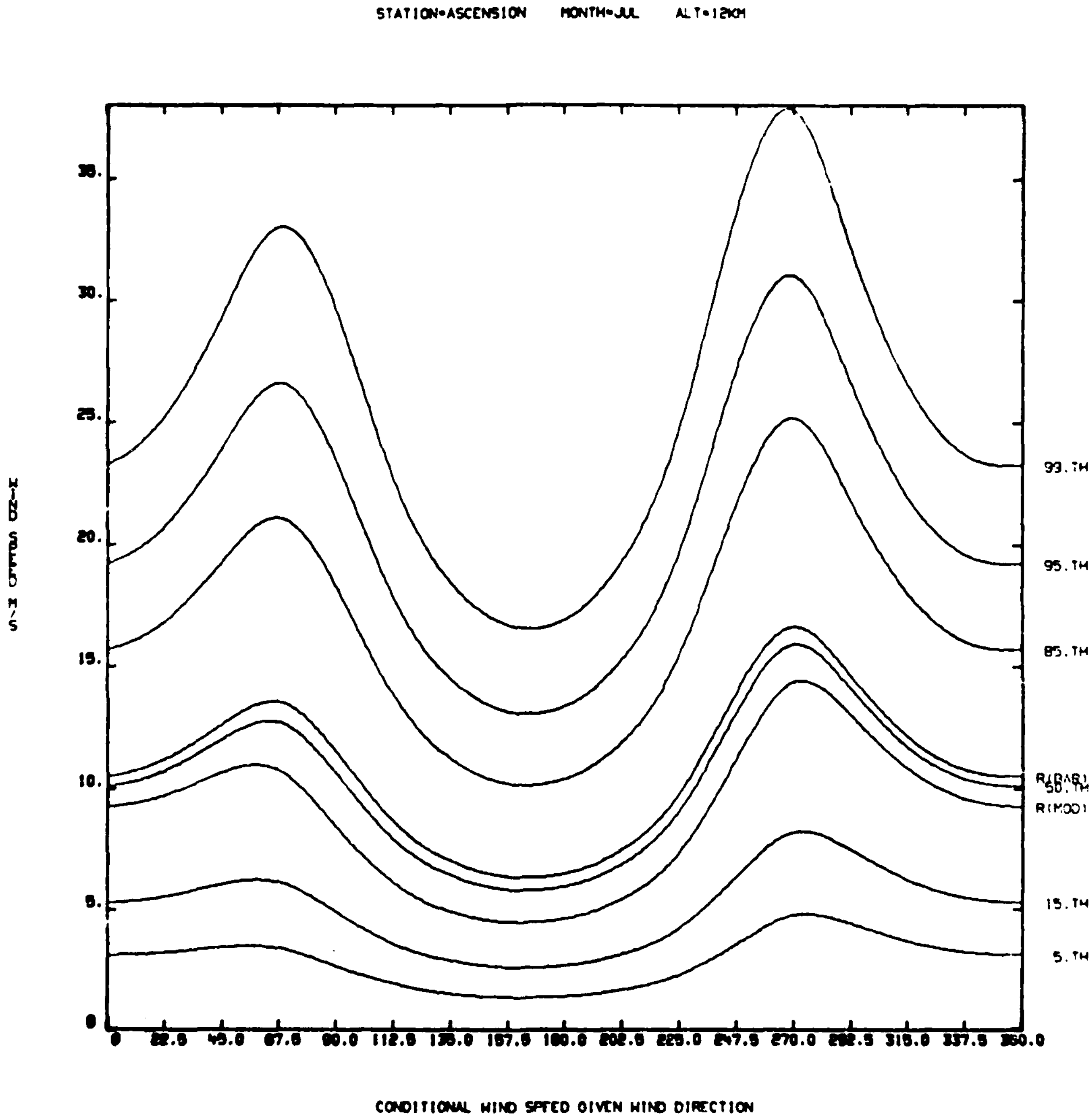

STATION=ASCENSION MONTH=JUL ALT=12KM
WIND SPEED M/S
35.
30.
25.
20.
15.
10.
5.
0
0 22.5 45.0 67.5 90.0 112.5 135.0 157.5 180.0 202.5 225.0 247.5 270.0 292.5 315.0 337.5 360.0
99.TH
95.TH
85.TH
R(BAR)
50.TH
R(MOD)
15.TH
5.TH
CONDITIONAL WIND SPEED GIVEN WIND DIRECTION

Figure A-58.

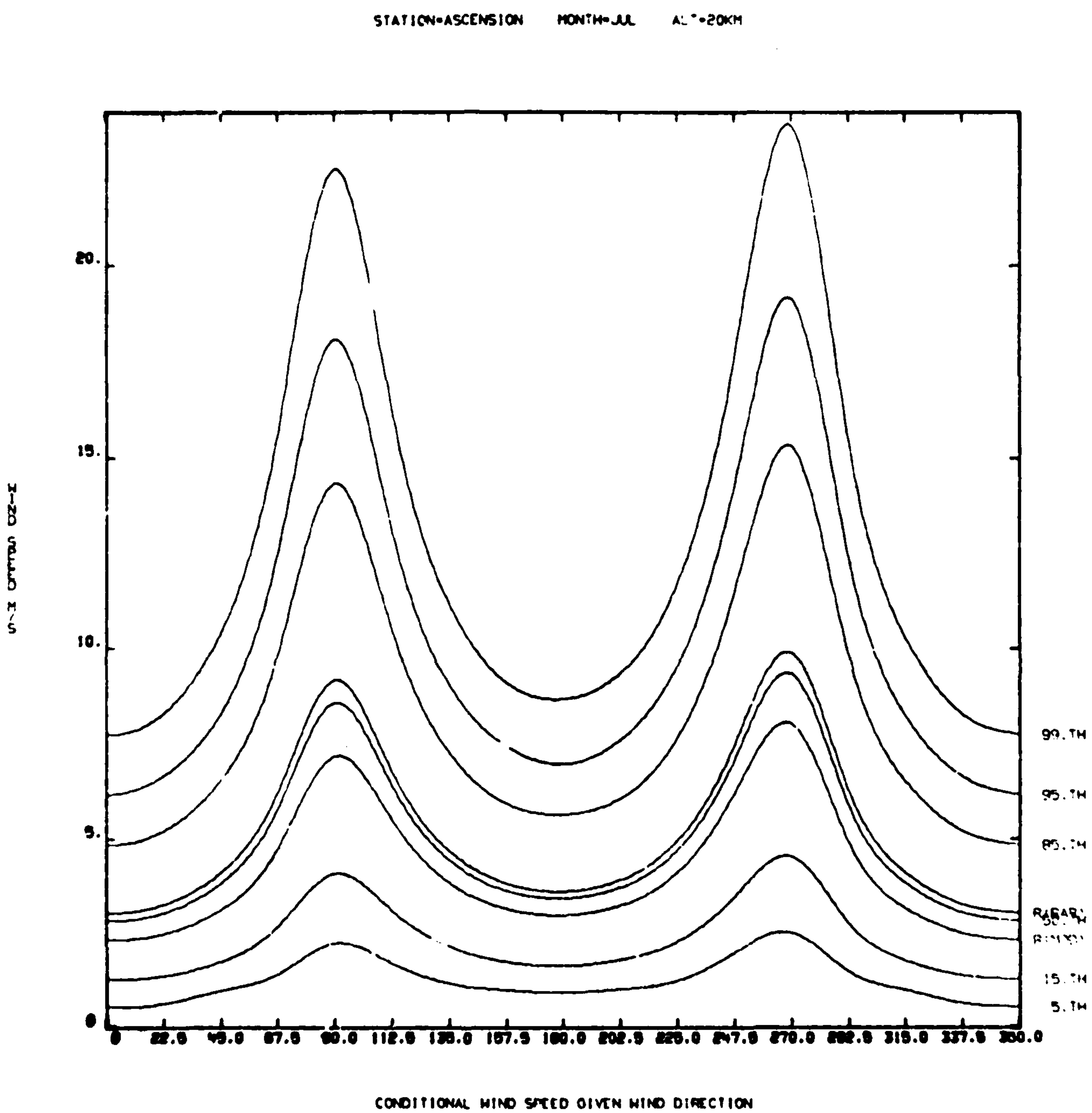
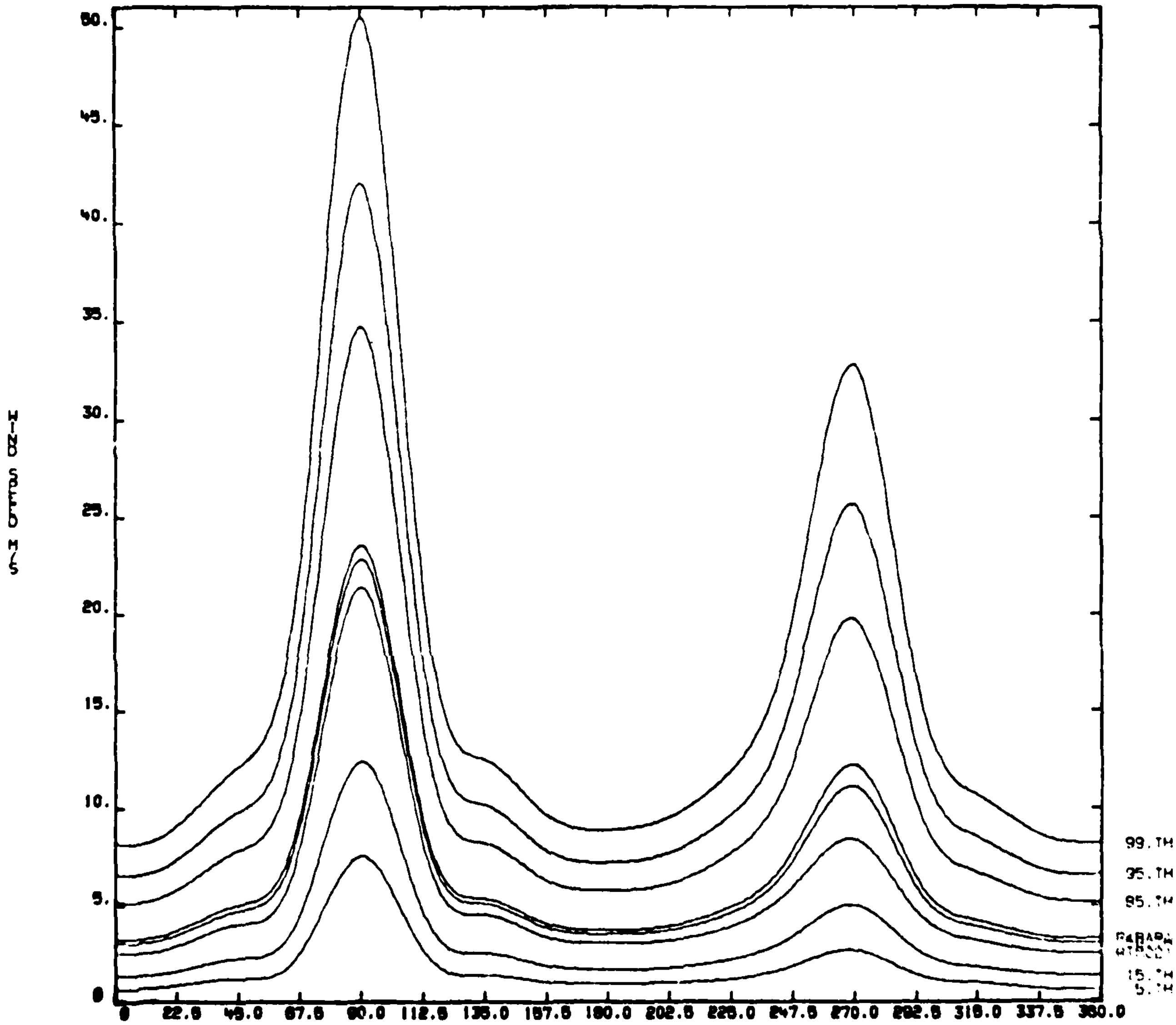

STATION=ASCENSION MONTH=JUL ALT=20KM
WIND SPEED M/S
20.
15.
10.
5.
0
0 22.5 45.0 67.5 90.0 112.5 135.0 157.5 180.0 202.5 225.0 247.5 270.0 292.5 315.0 337.5 360.0
99.TH
95.TH
85.TH
15.TH
5.TH
CONDITIONAL WIND SPEED GIVEN WIND DIRECTION

Figure A-59.

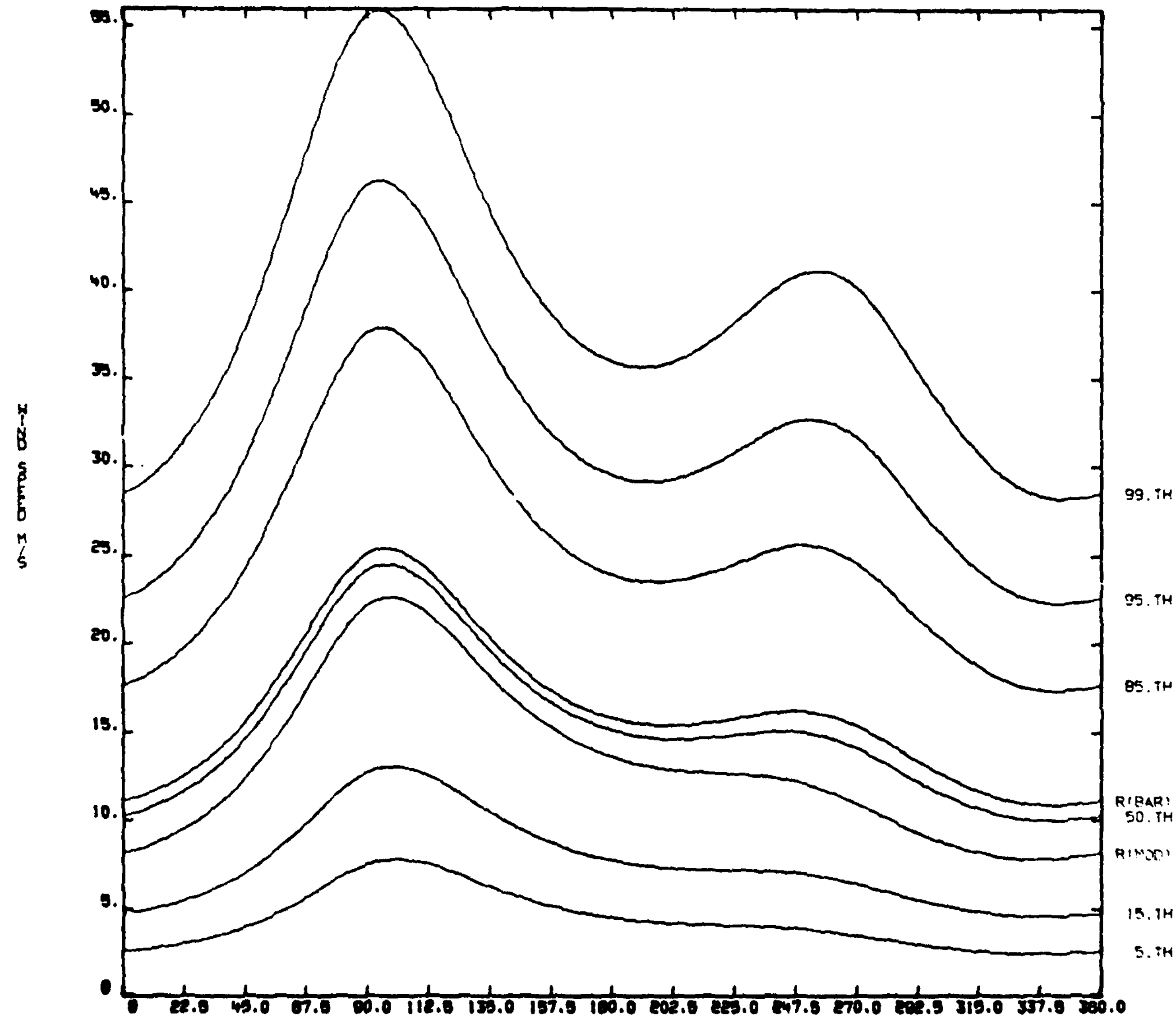
STATION=ASCENSION   MONTH=JUL   ALT=30KM



CONDITIONAL WIND SPEED GIVEN WIND DIRECTION

Figure A-60.

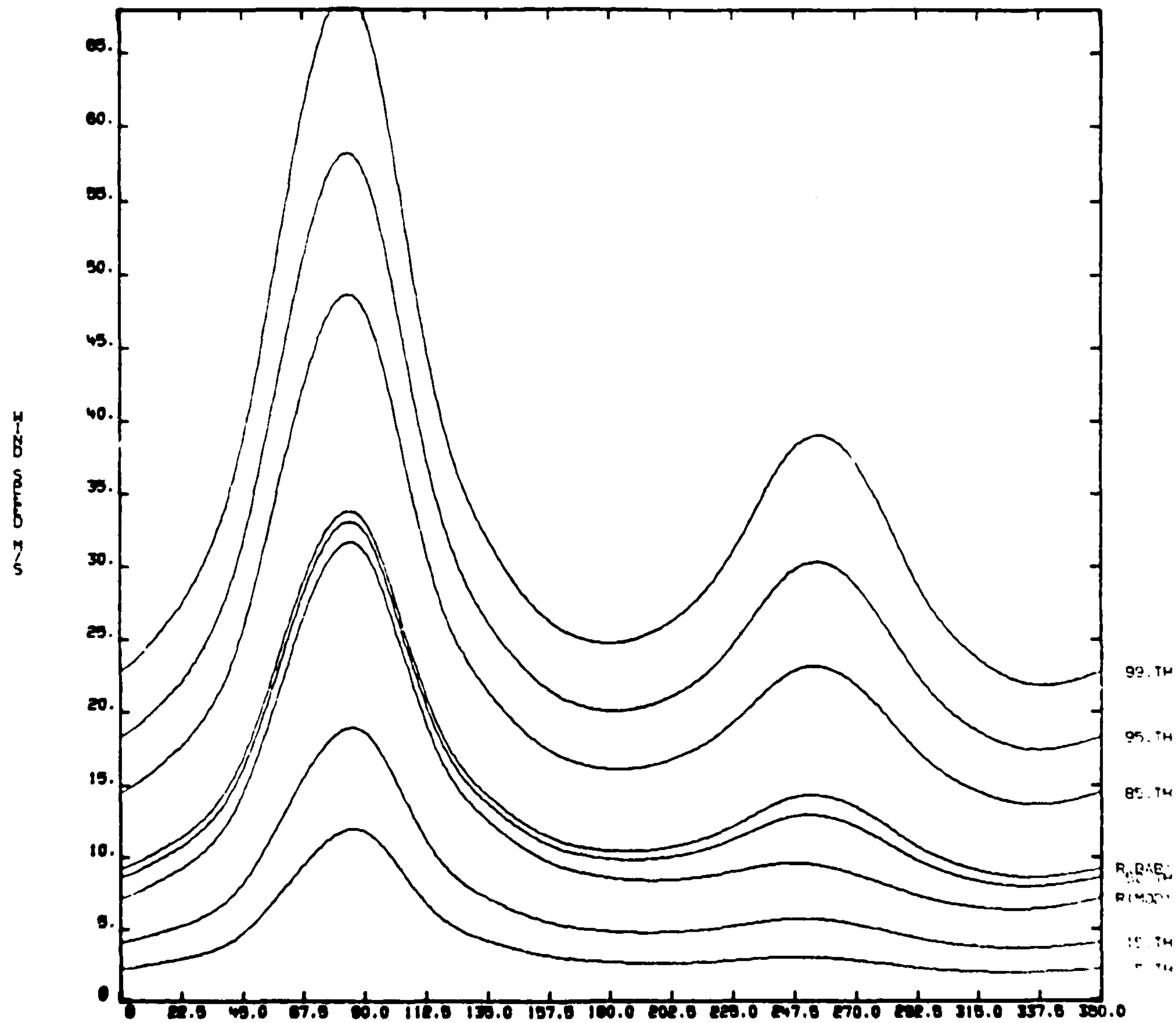
STATION=ASCENSION MONTH=JUL ALT=40KM



CONDITIONAL WIND SPEED GIVEN WIND DIRECTION

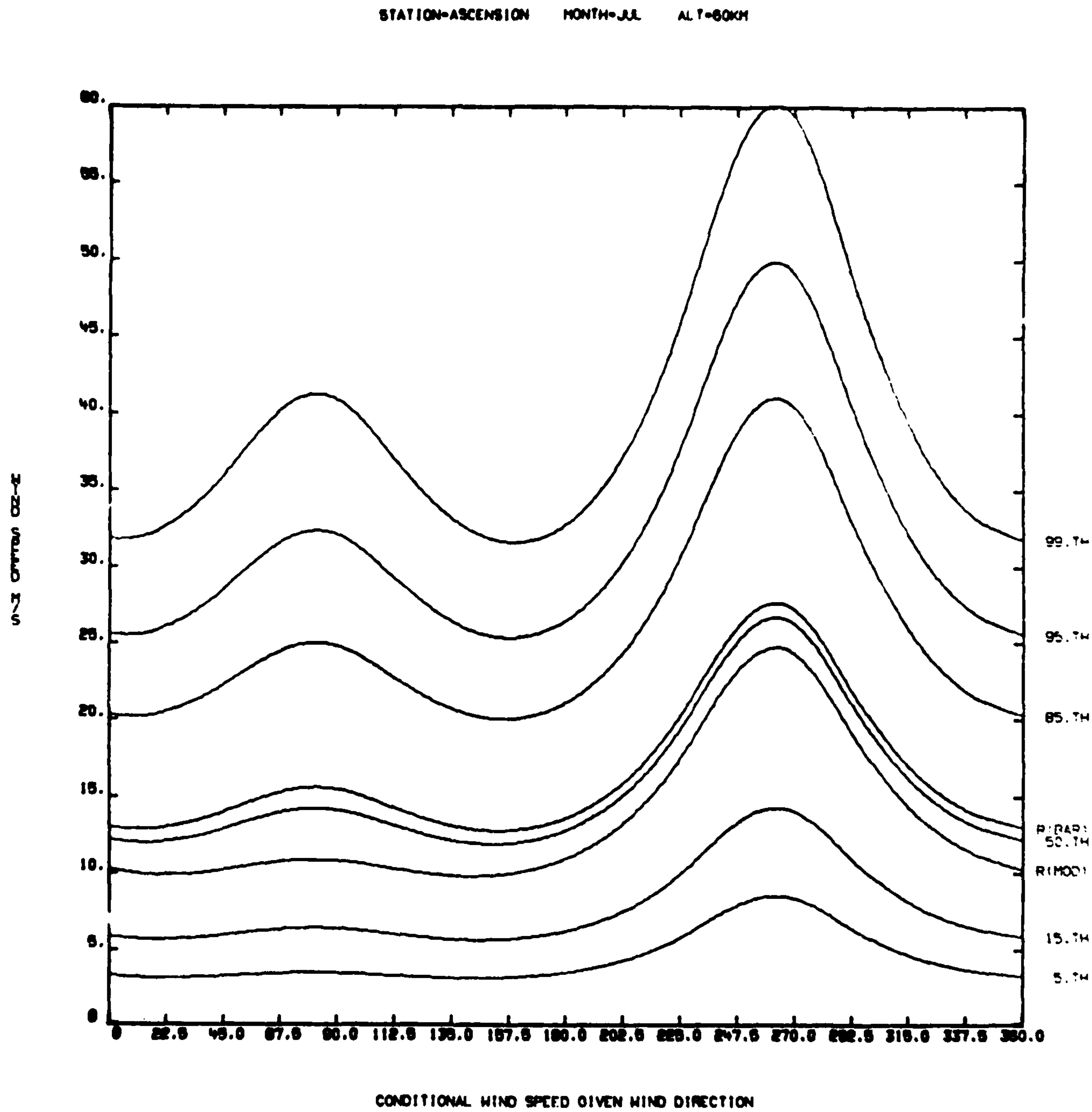
Figure A-61.

STATION=ASCENSION MONTH=JUL ALT=50KM



CONDITIONAL WIND SPEED GIVEN WIND DIRECTION

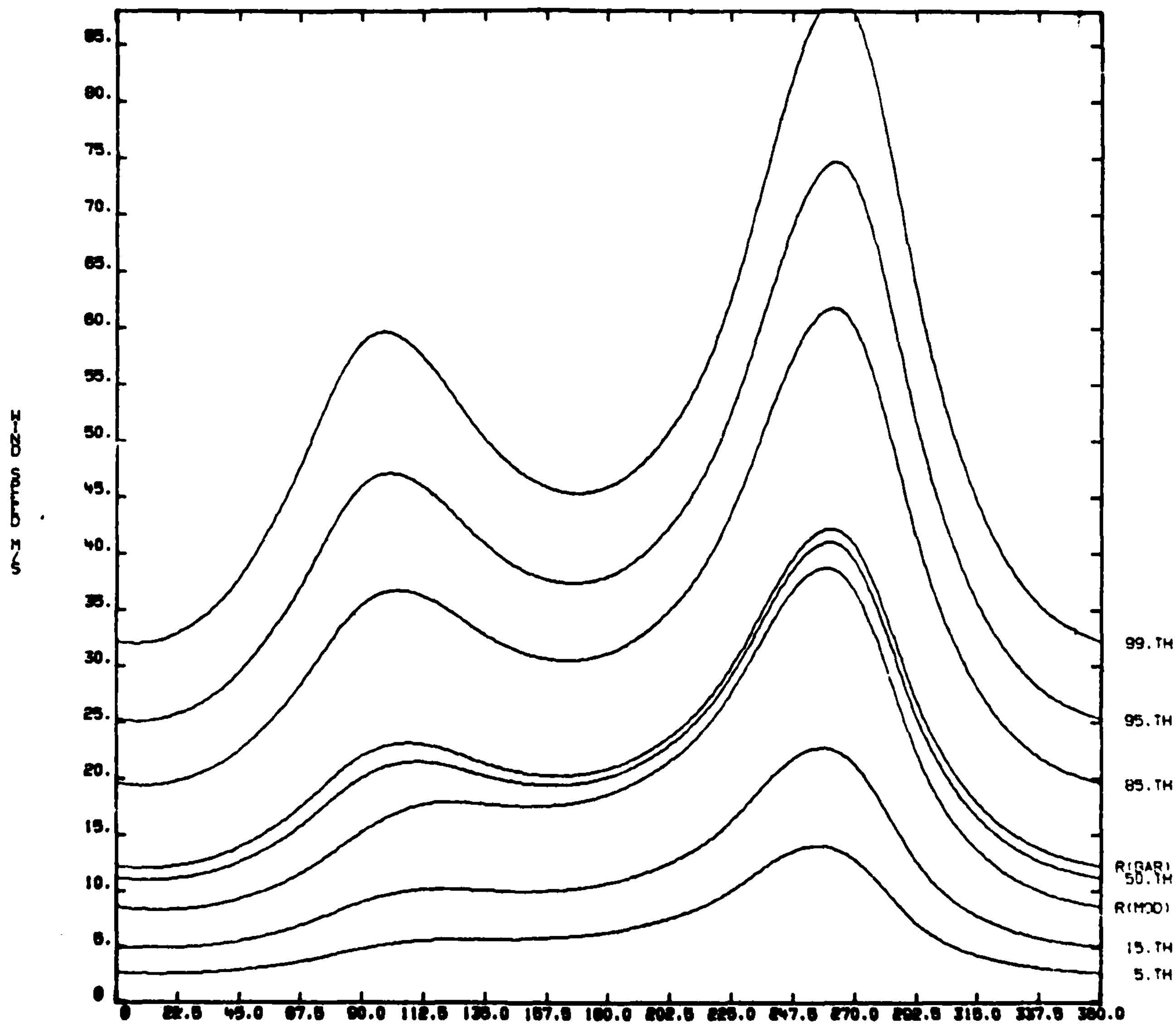
Figure A-62.



STATION=ASCENSION MONTH=JUL ALT=60KM
60.
55.
50.
45.
40.
35.
30.
25.
20.
15.
10.
5.
0
WIND SPEED M/S
99.TH
95.TH
85.TH
R(RAR)
50.TH
R(MOD)
15.TH
5.TH
0
22.5
45.0
67.5
90.0
112.5
135.0
157.5
180.0
202.5
225.0
247.5
270.0
292.5
315.0
337.5
360.0
CONDITIONAL WIND SPEED GIVEN WIND DIRECTION

Figure A-63.

STATION=ASCENSION   MONTH=JUL   ALT=66KM



CONDITIONAL WIND SPEED GIVEN WIND DIRECTION

Figure A-64.

APPENDIX B

RANGE SPECIFIC INFORMATION AND THERMODYNAMIC QUANTITIES FOR ASCENSION ISLAND, SOUTH ATLANTIC

1. Range Specific Information

To prevent further character size reduction for tables I through IV, certain range-specific information has been omitted. This important information is given in table B-1.

TABLE B-1

Header Record 0-30 Km	
Table Number	0
Data Source (1 = DATSAV, 2 = WDC-A)	1
Call Letters	FHAW
WMO Number	61902
Latitude	7°56'
Direction (N or S)	S
Longitude	14°25'
Direction (E or W)	W
Elevation in Meters	20
Start Period of Record (Mo-Yr)	160
End Period of Record (Mo-Yr)	1279
No. of Time Windows (0, 1 or 2)	1
Start Time Window #1 (Hr-MNZ)	900
End Time Window #1	1500
Start Time Window #2	0
End Time Window #2	0
Date of RRA	1180
Altitude Range of RRA Low Level (Km)	0
Altitude Range of RRA High Level (Km)	30
Standard Deviation of Thermodynamic Limits	6.0
Wind Limits	6.0

Header Record 32-66 Km	
Table Number	0
Data Source (1 = DATSAV, 2 = WDC-A)	2
Call Letters	FHAW
WMO Number	61902
Latitude	7°56'
Direction (N or S)	S
Longitude	14°25'
Direction (E or W)	W
Elevation in Meters	20
Start Period of Record (Mo-Yr)	169
End Period of Record (Mo-Yr)	1278
No. of Time Windows (0, 1 or 2)	1
Start Time Window #1 (Hr-MNZ)	900
End Time Window #1	1500
Start Time Window #2	0
End Time Window #2	0
Date of RRA	1180
Altitude Range of RRA Low Level (Km)	30
Altitude Range of RRA High Level (Km)	66
Standard Deviation of Thermodynamic Limits	6.0
Wind Limits	6.0

2. Thermodynamic Quantities

This section presents examples of further computations and graphical displays of pressure, density, and virtual temperature statistics that can be derived from the data given in tables II, III, and IV. No attempt is made to

present complete nor exhaustive illustrations that can be made to aid in visualizing the relations that can be made from the data in tables II and IV. The choices are those that aided the committee to verify the reasonableness of the tabulations.

2.1 Monthly Mean from the Annual Mean

The hydrostatic model values in table IV are used to compute (1) the monthly mean differences relative to the annual mean values of pressure, density, and virtual temperature expressed in percent and (2) the monthly mean difference in virtual temperature for the annual mean virtual temperature expressed in degrees Kelvin. Examples of these four statistics are given in table B-2 for January and table B-3 for July. Graphical displays of the four statistics contained in tables B-2 and B-3 are shown in figures B-1 through B-8. Also, the relative differences between the monthly mean values from table IV-1 through IV-12 for all months from the annual mean values (table IV-13) are illustrated in figure B-9 for pressure, in figure B-10 for density, and in figure B-11 for virtual temperature. The monthly mean virtual temperature differences from the annual mean virtual temperature for all months are given in figure B-12. The simple sum of the monthly mean differences from the annual mean values of these quantities is not zero. This is because the annual mean statistical parameters are computed (see section III. C.3) by weighting the monthly means by the number of observations in each month.

2.2 Coefficients of Variation and Derived Correlation Coefficients

The coefficient of variation, C_V, is defined by the standard deviation with respect to the mean divided by the mean. The coefficients of variation for pressure, C_VP, and density, C_VD, were computed using the standard deviations from table II and the hydrostatic mean values from table IV. The coefficient of variation for temperature uses the standard deviations of virtual temperature from table III to the altitude where virtual temperature exists. Above this altitude, the standard deviations of temperature are from table II. The mean values for temperature (virtual temperature to the altitude where it exists) are taken from table IV. No distinction is made in the table headings in table B-4 (January) and table B-5 (July) and all related figures between virtual temperature and temperature.

From the coefficients of variation for pressure, density, and temperature (virtual temperature to the altitude where it exists), the correlation coefficients between these quantities are derived using Buell's method (see reference in text). The equations for these derived correlation coefficients are

$$r(P,T) = \frac{(C_VT)^2 + (C_VP)^2 - (C_VD)^2}{2\,[C_VT \cdot C_VP]} \quad , \qquad \text{(B-1)}$$

$$r(P,D) = \frac{(C_VD)^2 - (C_VT)^2 + (C_VP)^2}{2\,[C_VP \cdot C_VD]} \quad , \qquad \text{(B-2)}$$

$$r(T,D) = \frac{(C_VP)^2 - (C_VD)^2 - (C_VT)^2}{2\ [C_VT \cdot C_VD]} \quad . \qquad \text{(B-3)}$$

The correlation coefficients in tables B-4 and B-5 are derived from the above equations.

A test for the validity of the derived correlation coefficient is that all three of the following inequalities be satisfied.

$$\left.\begin{aligned} C_VP - [C_VD + C_VT] < 0 \\ C_VD - [C_VT + C_VP] < 0 \\ C_VT - [C_VP + C_VD] < 0 \end{aligned}\right\} \qquad \text{(B-4)}$$

In these examples (tables B-4 and B-5) the numerical values from equation (B-4) are all negative; hence, the derived correlation test is considered valid. The rare exceptions to this test for several RRAs occur at the extreme highest altitudes, where sample sizes for the statistical sample are small.

The statistical parameters from table B-4 (January) and table B-5 (July) are illustrated in figures B-13 through B-16.

For all months the C_VP values are shown in figure B-17, the C_VD values are shown in figure B-18, and C_VT values are shown in figure B-19. If the abscissa on the figures for the coefficient of variation were multiplied by 100, these figures would show the percentage of random dispersion of these qualities over the month with respect to the monthly mean for these thermodynamic quantities.

The derived correlation coefficients for all months are illustrated in the following figures:

a) Figure B-20 gives r(P,D).

b) Figure B-21 gives r(P,T).

c) Figure B-22 gives r(T,D).

Table B-2.

STATION 819020 MONTH 1
DELTAS IN PERCENT RELATIVE TO ANNUAL

LEVEL	PRESSURE	DENSITY	TEMP.	TMO-TANN(DEG.K)
.000	-.15	-.26	.07	.20
.020	-.14	-.17	.08	.23
1.000	-.13	-.37	.20	.59
2.000	-.10	-.42	.32	.92
3.000	-.07	-.20	.13	.37
4.000	-.07	-.01	-.06	-.18
5.000	-.08	.03	-.11	-.31
6.000	-.09	-.02	-.07	-.20
7.000	-.11	.05	-.16	-.43
8.000	-.14	.12	-.24	-.61
9.000	-.17	.11	-.28	-.70
10.000	-.21	.05	-.25	-.53
11.000	-.24	-.05	-.20	-.45
12.000	-.26	-.15	-.10	-.23
13.000	-.27	-.30	.03	.07
14.000	-.26	-.38	.15	.31
15.000	-.24	-.31	.07	.14
16.000	-.24	-.10	-.15	-.30
17.000	-.31	.30	-.61	-1.20
18.000	-.47	.80	-1.30	-2.58
19.000	-.69	.61	-1.32	-2.68
20.000	-.89	.21	-1.10	-2.29
21.000	-1.06	-.08	-.98	-2.07
22.000	-1.21	-.27	-.94	-2.01
23.000	-1.37	-.34	-1.04	-2.26
24.000	-1.54	-.36	-1.18	-2.58
25.000	-1.72	-.49	-1.23	-2.72
26.000	-1.90	-.81	-1.11	-2.49
27.000	-2.05	-1.12	-.94	-2.12
28.000	-2.18	-1.43	-.77	-1.76
29.000	-2.28	-1.72	-.56	-1.29
30.000	-2.36	-1.85	-.51	-1.19
32.000	-2.58	-1.25	-1.04	-2.46
34.000	-2.93	-1.17	-1.48	-3.55
36.000	-3.37	-1.36	-1.74	-4.27
38.000	-3.86	-1.68	-1.91	-4.79
40.000	-4.33	-2.29	-1.78	-4.59
42.000	-4.67	-3.47	-.92	-2.43
44.000	-4.87	-3.84	-.76	-2.04
46.000	-5.09	-3.64	-1.03	-2.78
48.000	-5.30	-4.24	-.78	-2.10
50.000	-5.39	-5.15	.07	.18
52.000	-5.27	-5.89	.97	2.60
54.000	-4.96	-6.16	1.59	4.22
56.000	-4.50	-6.35	2.29	6.00
58.000	-3.94	-5.89	2.37	6.12
60.000	-3.36	-5.25	2.32	5.23
62.000	-2.72	-5.04	2.76	6.65
64.000	-1.95	-4.70	3.22	7.81
66.000	-1.24	-2.89	2.03	4.78

Table B-3.

STATION 619020 MONTH 7
DELTAS IN PERCENT RELATIVE TO ANNUAL

LEVEL	PRESSURE	DENSITY	TEMP.	TMO-TANN''DEG.K)
.000	.24	.52	-.28	-.66
.020	.24	.52	-.27	-.81
1.000	.20	.56	-.34	-1.00
2.000	.14	.92	-.78	-2.26
3.000	.07	.34	-.26	-.75
4.000	.05	.14	-.10	-.27
5.000	.04	.11	-.07	-.20
6.000	.03	.13	-.09	-.25
7.000	.01	.17	-.16	-.42
8.000	-.01	.25	-.26	-.65
9.000	-.05	.28	-.35	-.85
10.000	-.11	.29	-.40	-.95
11.000	-.17	.24	-.43	-.98
12.000	-.23	.18	-.39	-.86
13.000	-.28	.00	-.29	-.62
14.000	-.31	-.23	-.05	-.11
15.000	-.29	-.57	.30	.60
16.000	-.21	-.92	.70	1.38
17.000	-.03	-1.45	1.39	2.73
18.000	.25	-1.59	1.90	3.73
19.000	.54	-1.05	1.65	3.36
20.000	.79	-.61	1.42	2.96
21.000	1.00	-.16	1.17	2.47
22.000	1.16	.31	.84	1.80
23.000	1.28	.58	.68	1.48
24.000	1.37	.90	.47	1.04
25.000	1.44	1.01	.43	.96
26.000	1.50	1.16	.33	.74
27.000	1.54	1.33	.19	.43
28.000	1.55	1.71	-.15	-.34
29.000	1.49	2.00	-.50	-1.14
30.000	1.41	2.01	-.58	-1.35
32.000	1.25	1.62	-.50	-1.17
34.000	1.11	1.50	-.48	-1.15
36.000	.92	1.66	-.84	-2.06
38.000	.67	1.55	-.98	-2.46
40.000	.37	1.54	-1.26	-3.24
42.000	-.01	1.56	-1.65	-4.35
44.000	-.42	1.04	-1.57	-4.20
46.000	-.74	.05	-.93	-2.52
48.000	-.95	-.28	-.75	-2.02
50.000	-1.10	-.80	-.46	-1.24
52.000	-1.14	-1.32	.07	.20
54.000	-1.14	-1.24	-.00	-.01
56.000	-1.15	-1.14	-.12	-.32
58.000	-1.21	-.96	-.37	-.95
60.000	-1.33	-.90	-.55	-1.40
62.000	-1.64	.04	-1.78	-4.41
64.000	-2.29	.59	-2.96	-7.17
66.000	-2.99	-1.07	-2.03	-4.77

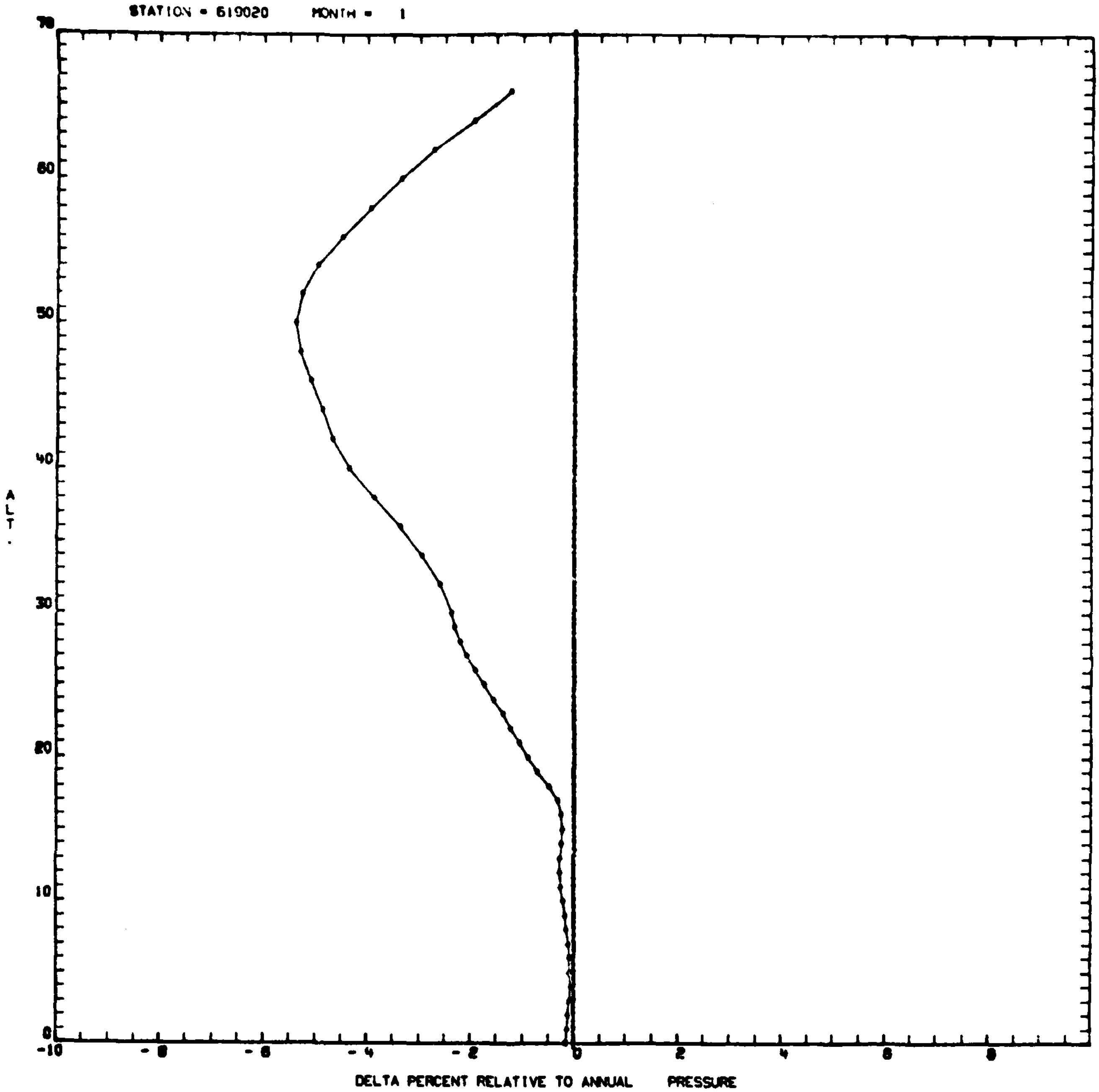

STATION = 619020 MONTH = 1
ALT.
70
60
50
40
30
20
10
0
-10
-8
-6
-4
-2
0
2
4
6
8
DELTA PERCENT RELATIVE TO ANNUAL PRESSURE

Figure B-1.

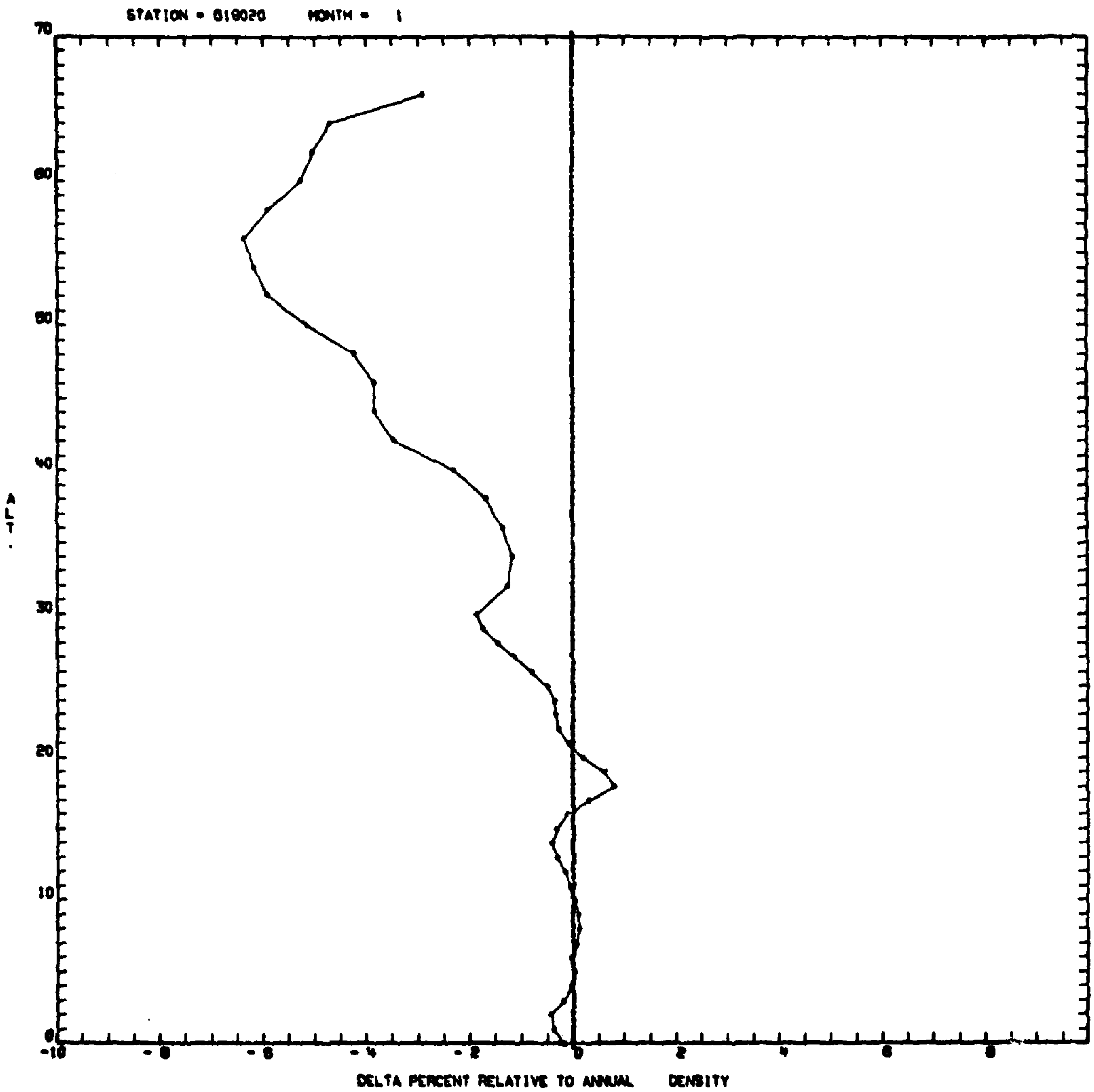

STATION = 619020 MONTH = 1
70
60
50
40
30
20
10
0
ALT.
-10
-8
-6
-4
-2
0
2
4
6
8
DELTA PERCENT RELATIVE TO ANNUAL DENSITY

Figure B-2.

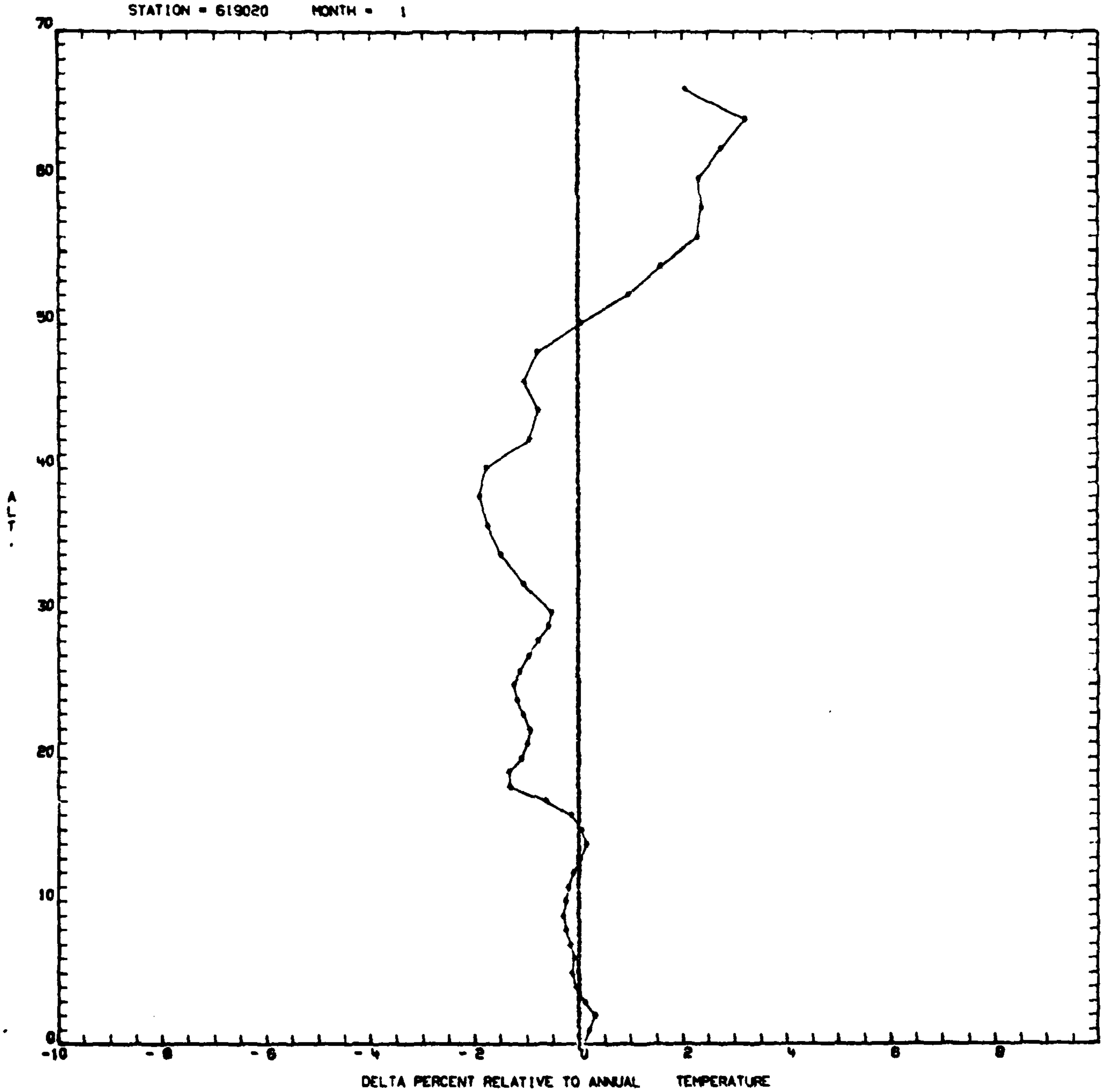

STATION = 619020 MONTH = 1
70
60
50
40
30
20
10
0
ALT.
-10
-8
-6
-4
-2
0
2
4
6
8
DELTA PERCENT RELATIVE TO ANNUAL TEMPERATURE

Figure B-3.

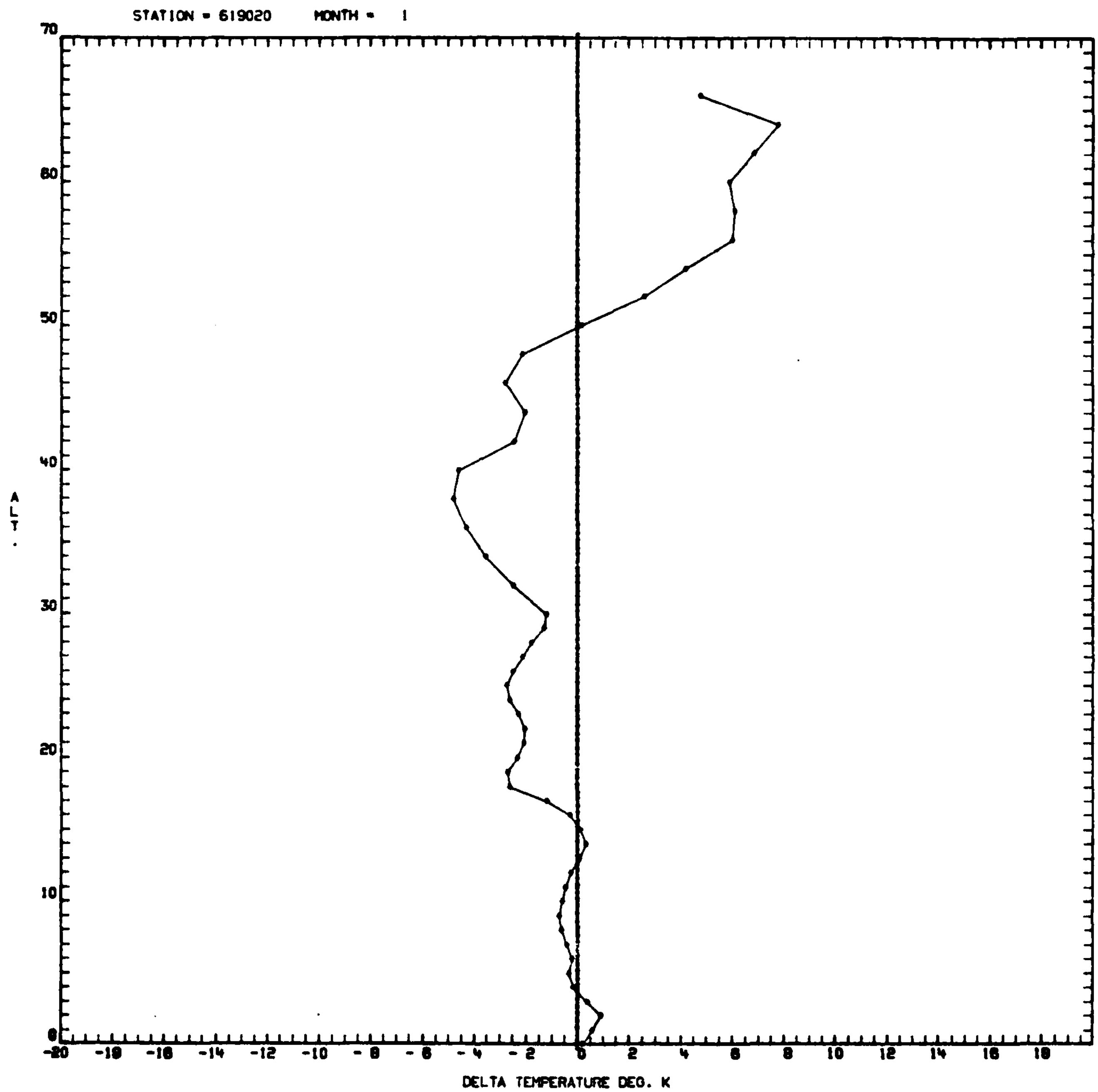

STATION = 619020 MONTH = 1
70
60
50
40
30
20
10
0
A L T .
-20 -18 -16 -14 -12 -10 -8 -6 -4 -2 0 2 4 6 8 10 12 14 16 18
DELTA TEMPERATURE DEG. K

Figure B-4.

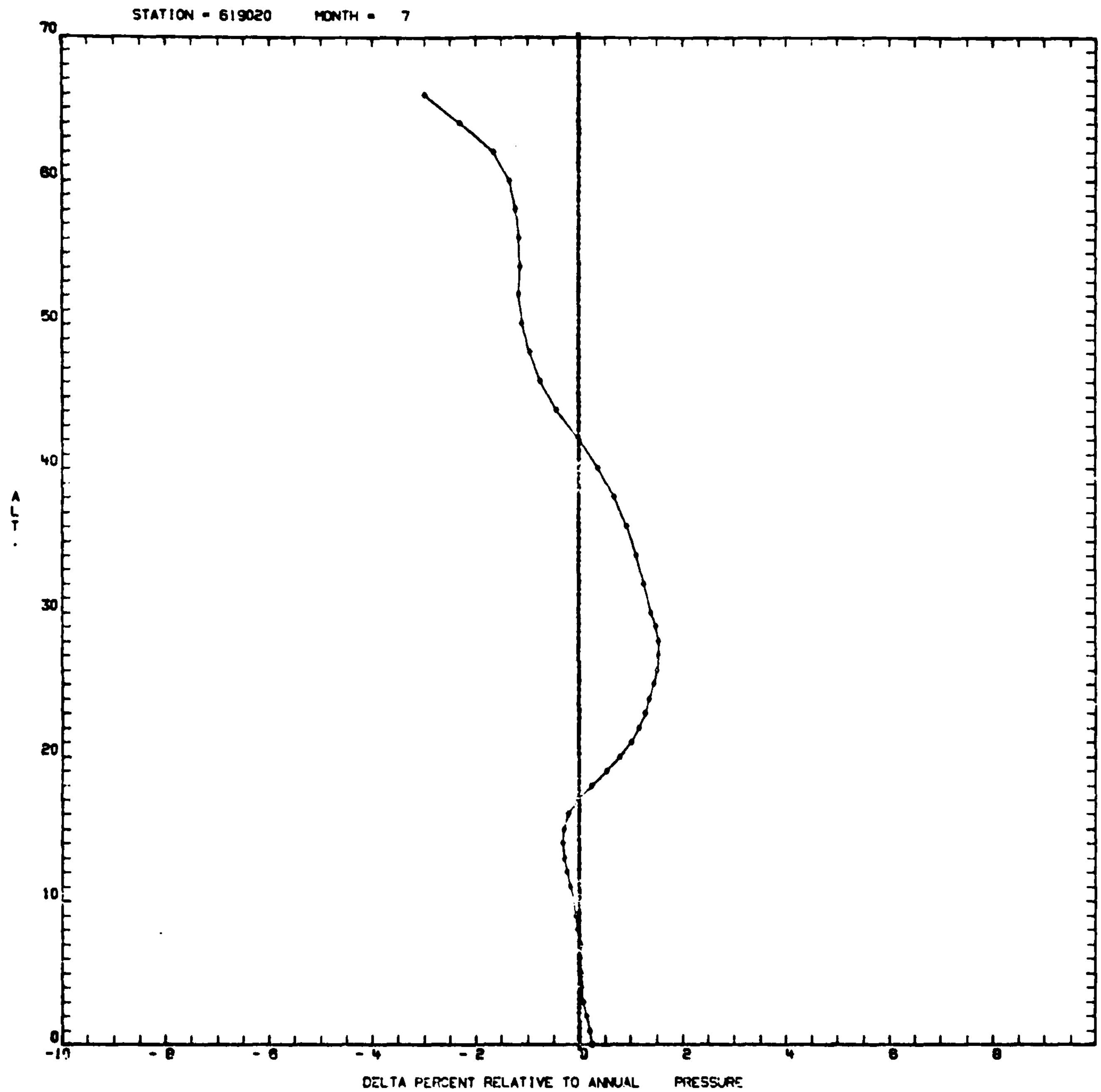

STATION = 619020 MONTH = 7
70
60
50
40
30
20
10
0
ALT.
-10
-8
-6
-4
-2
0
2
4
6
8
DELTA PERCENT RELATIVE TO ANNUAL PRESSURE

Figure B-5.

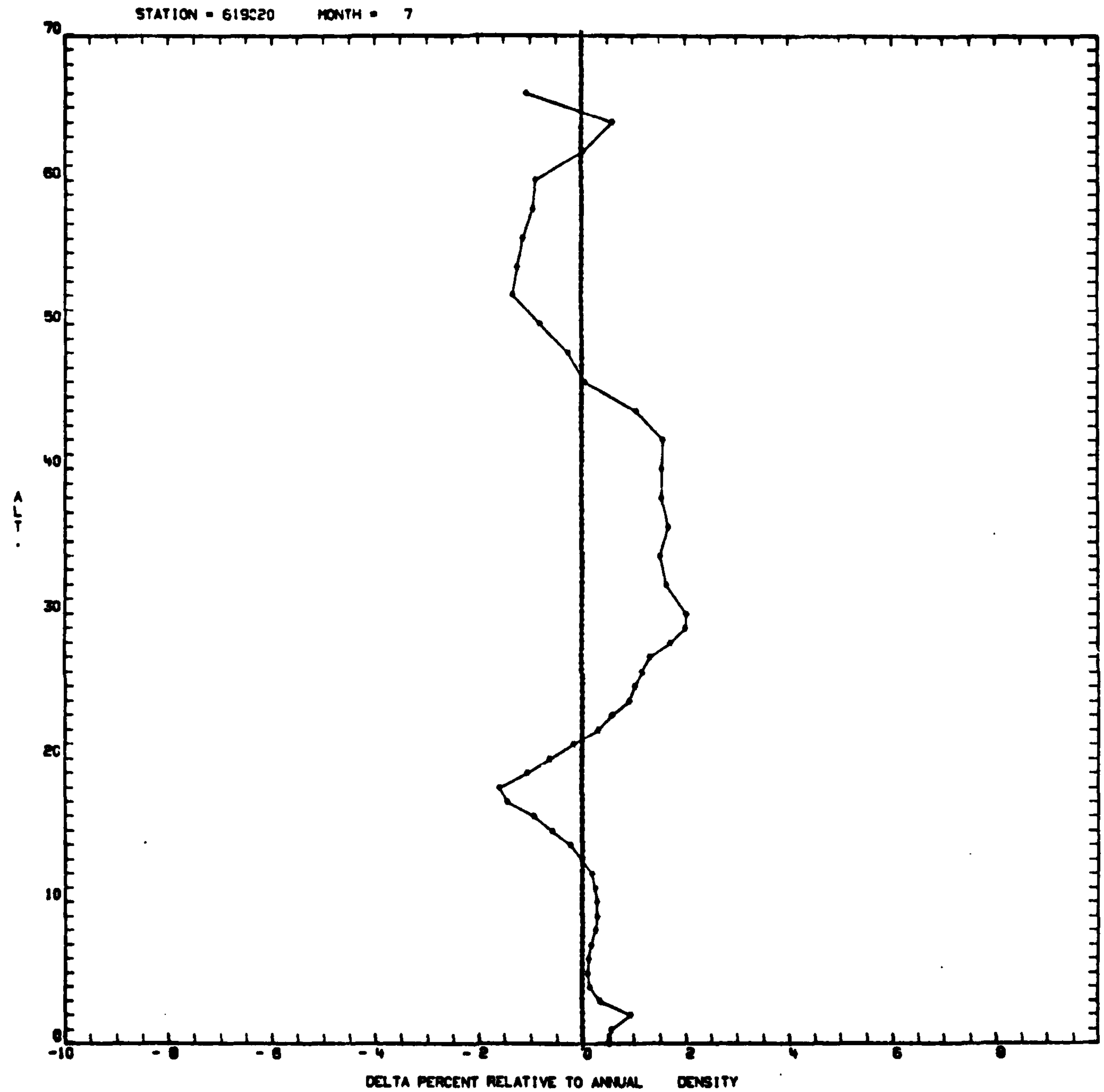
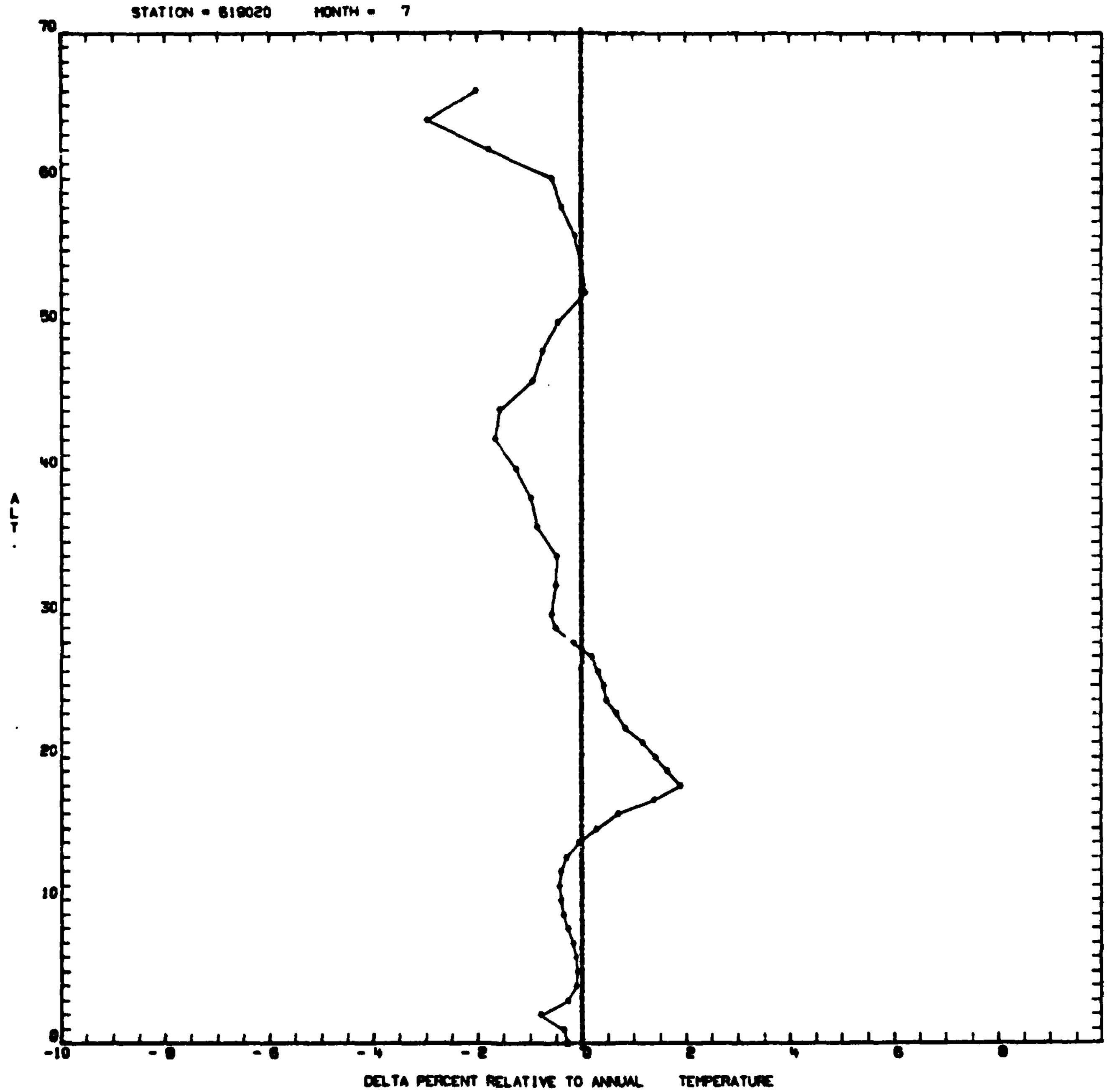

STATION = 619020 MONTH = 7
ALT.
DELTA PERCENT RELATIVE TO ANNUAL DENSITY
70
60
50
40
30
20
10
0
-10
-8
-6
-4
-2
0
2
4
6
8

Figure B-6.



STATION = 619020 MONTH = 7
70
60
50
40
30
20
10
0
A
L
T
.
-10
-8
-6
-4
-2
0
2
4
6
8
DELTA PERCENT RELATIVE TO ANNUAL TEMPERATURE

Figure B-7.

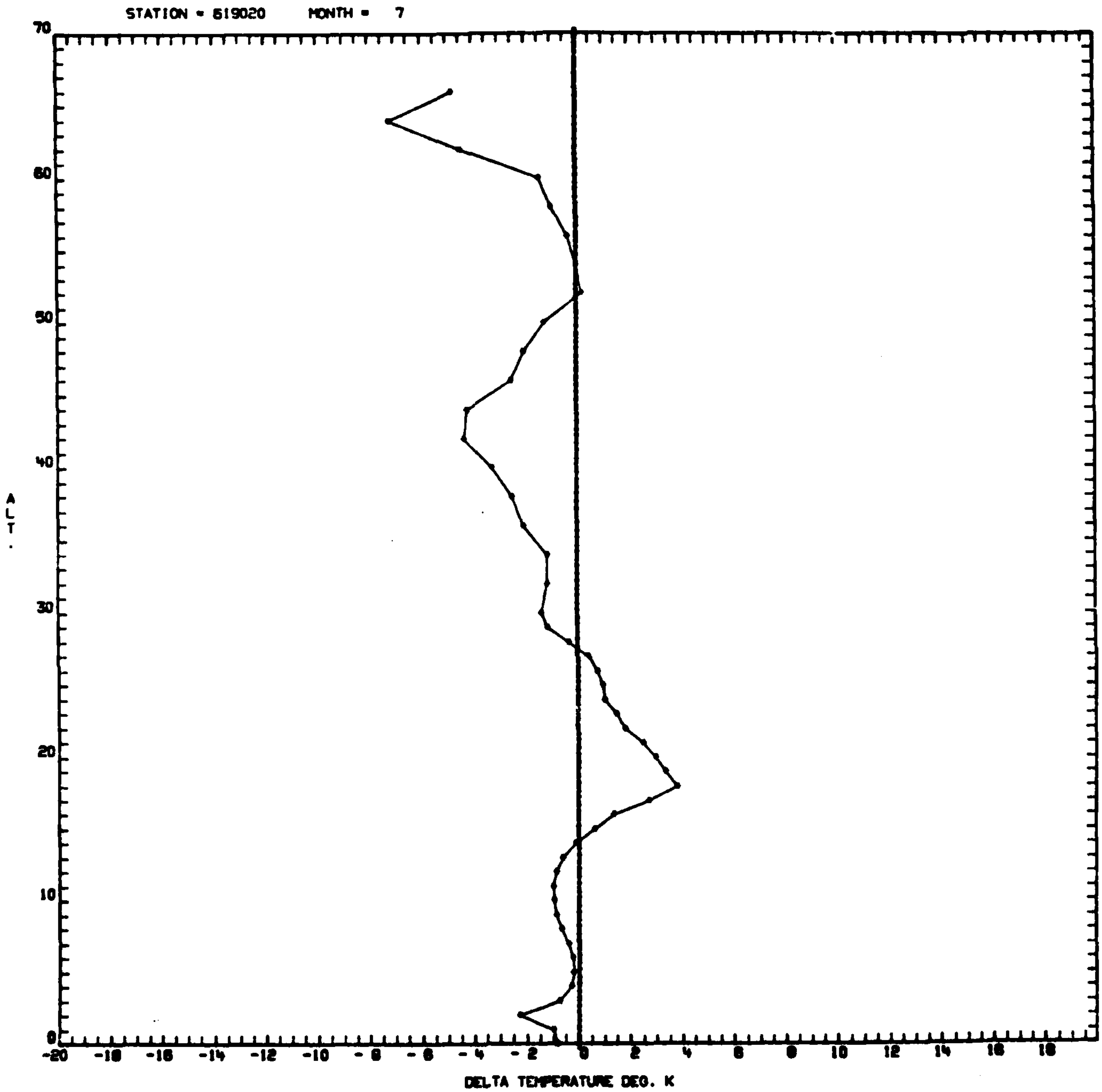


Figure B-8.

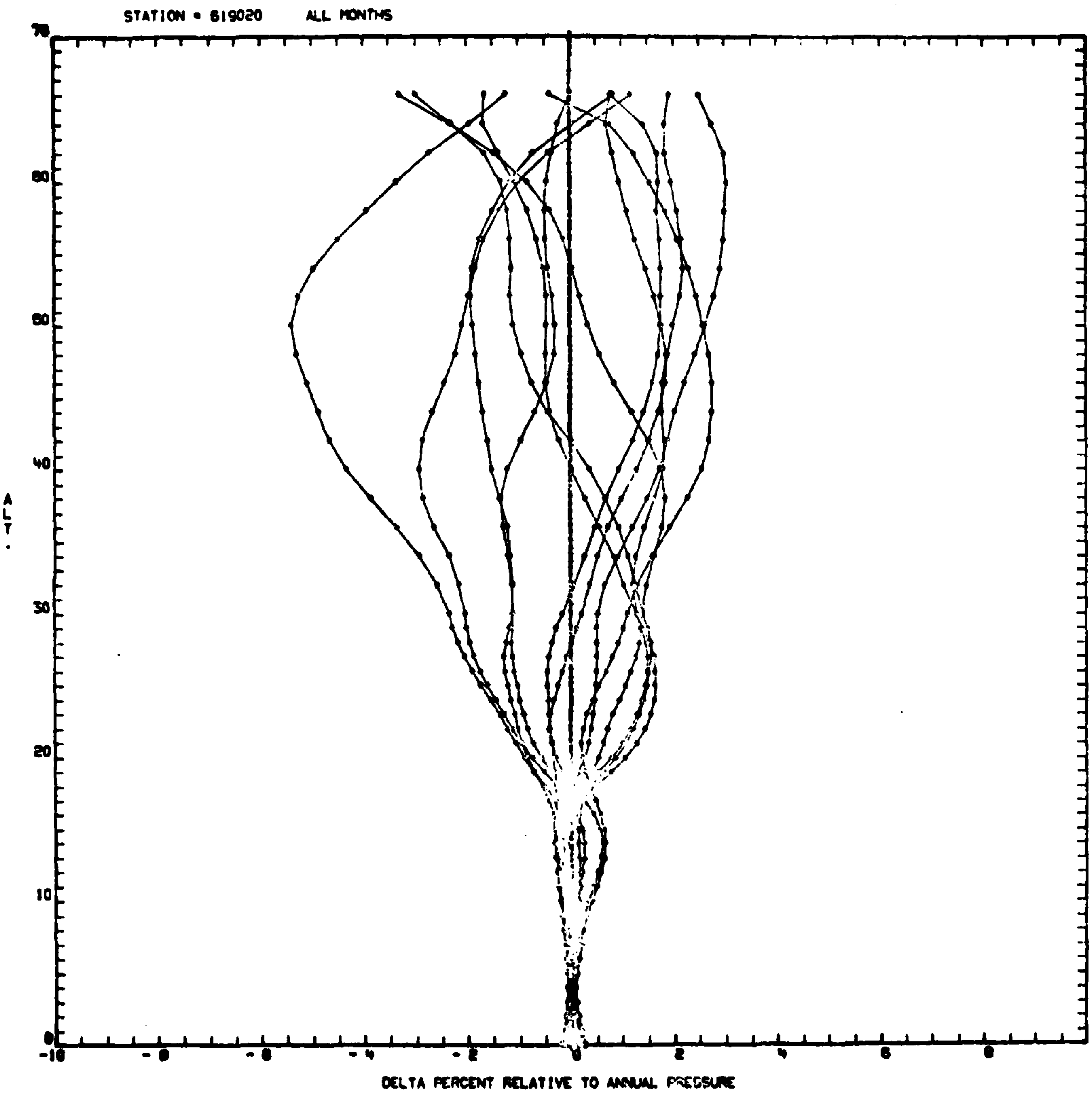

STATION = 619020 ALL MONTHS
70
60
50
40
30
20
10
0
ALT.
-10
-8
-6
-4
-2
0
2
4
6
8
DELTA PERCENT RELATIVE TO ANNUAL PRESSURE

Figure B-9.

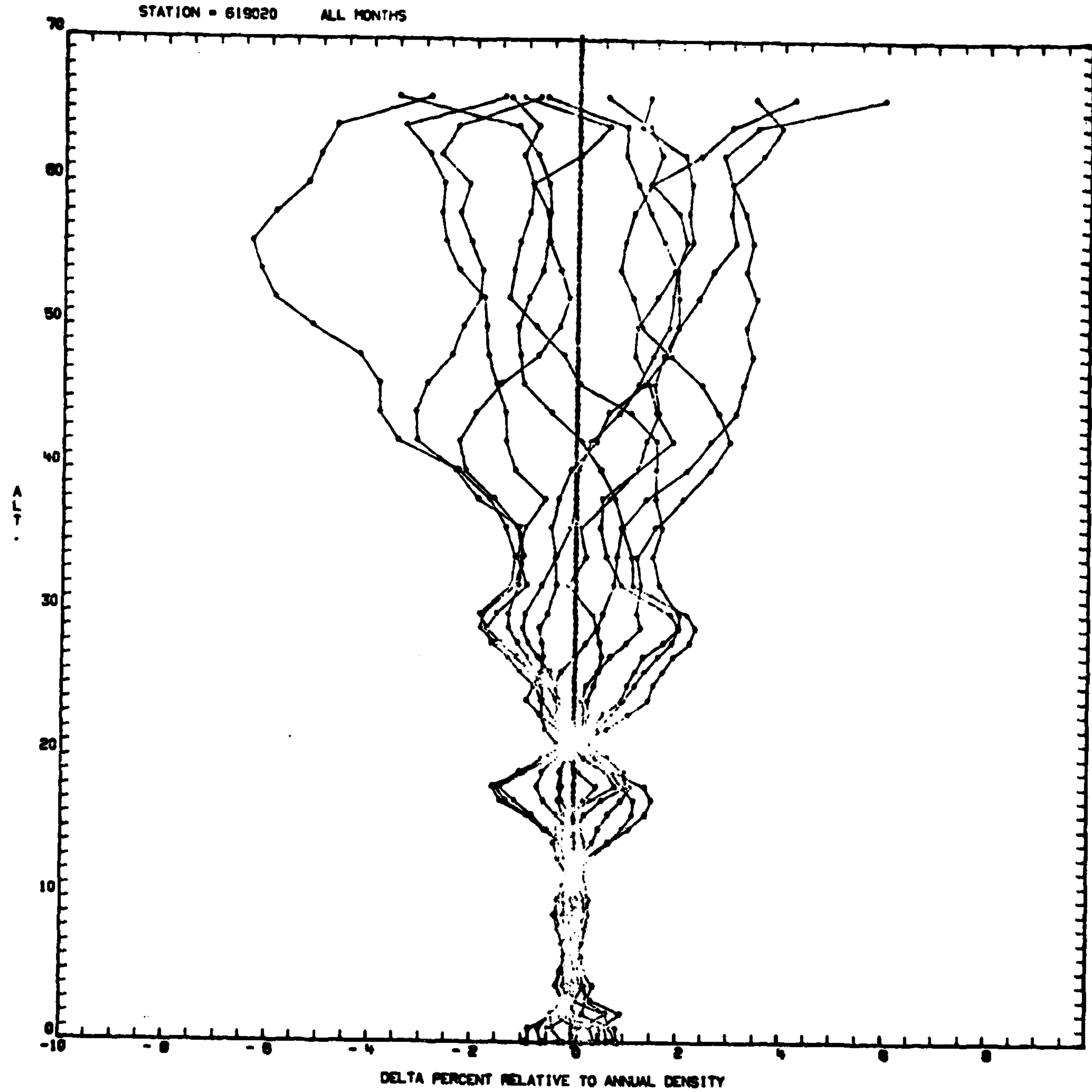
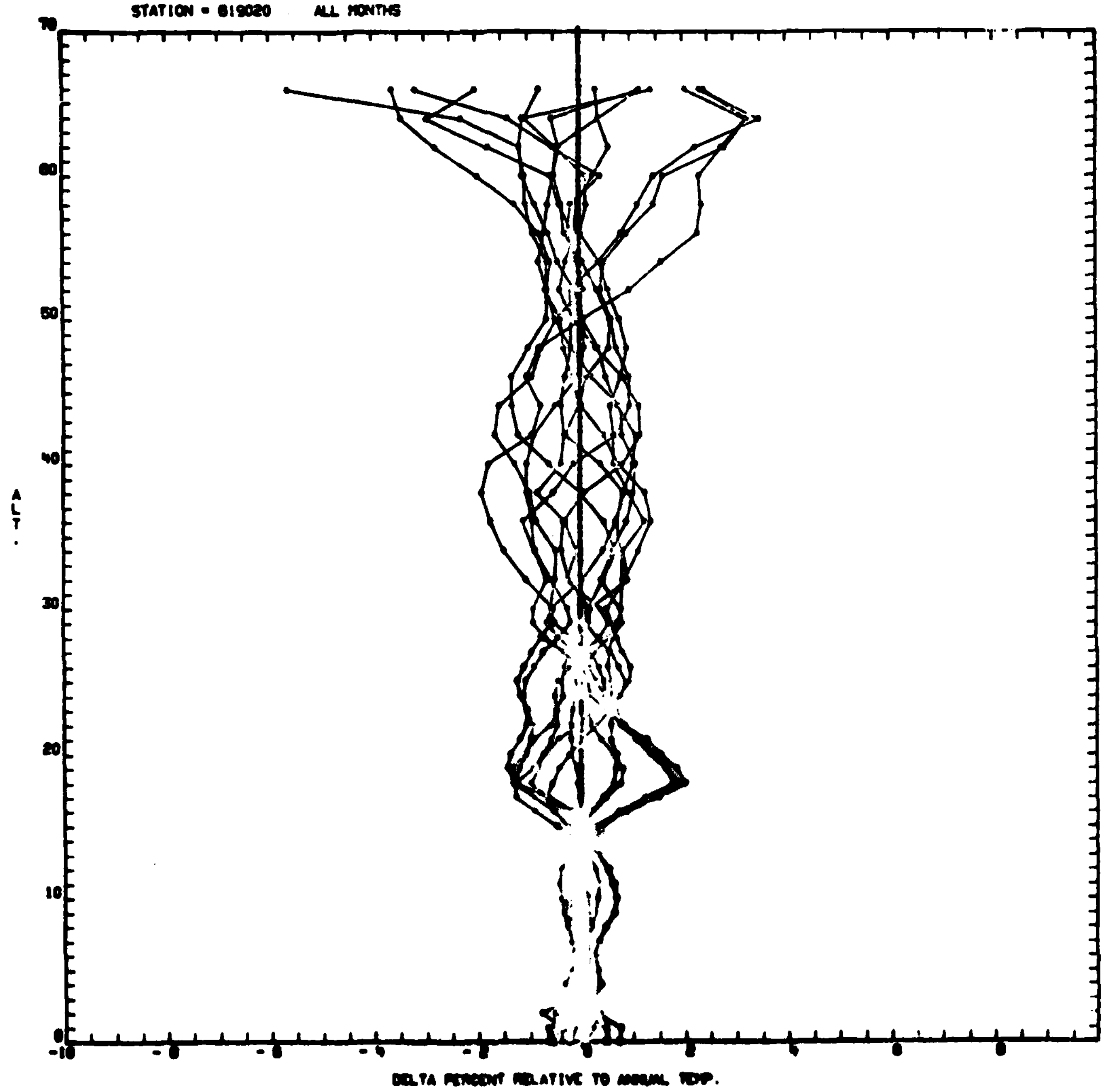

STATION = 619020 ALL MONTHS
70
60
50
40
30
20
10
0
ALT.
-10
-8
-6
-4
-2
0
2
4
6
8
DELTA PERCENT RELATIVE TO ANNUAL DENSITY

Figure B-10.



STATION = 819020 ALL MONTHS
ALT.
DELTA PERCENT RELATIVE TO ANNUAL TEMP.

Figure B-11.

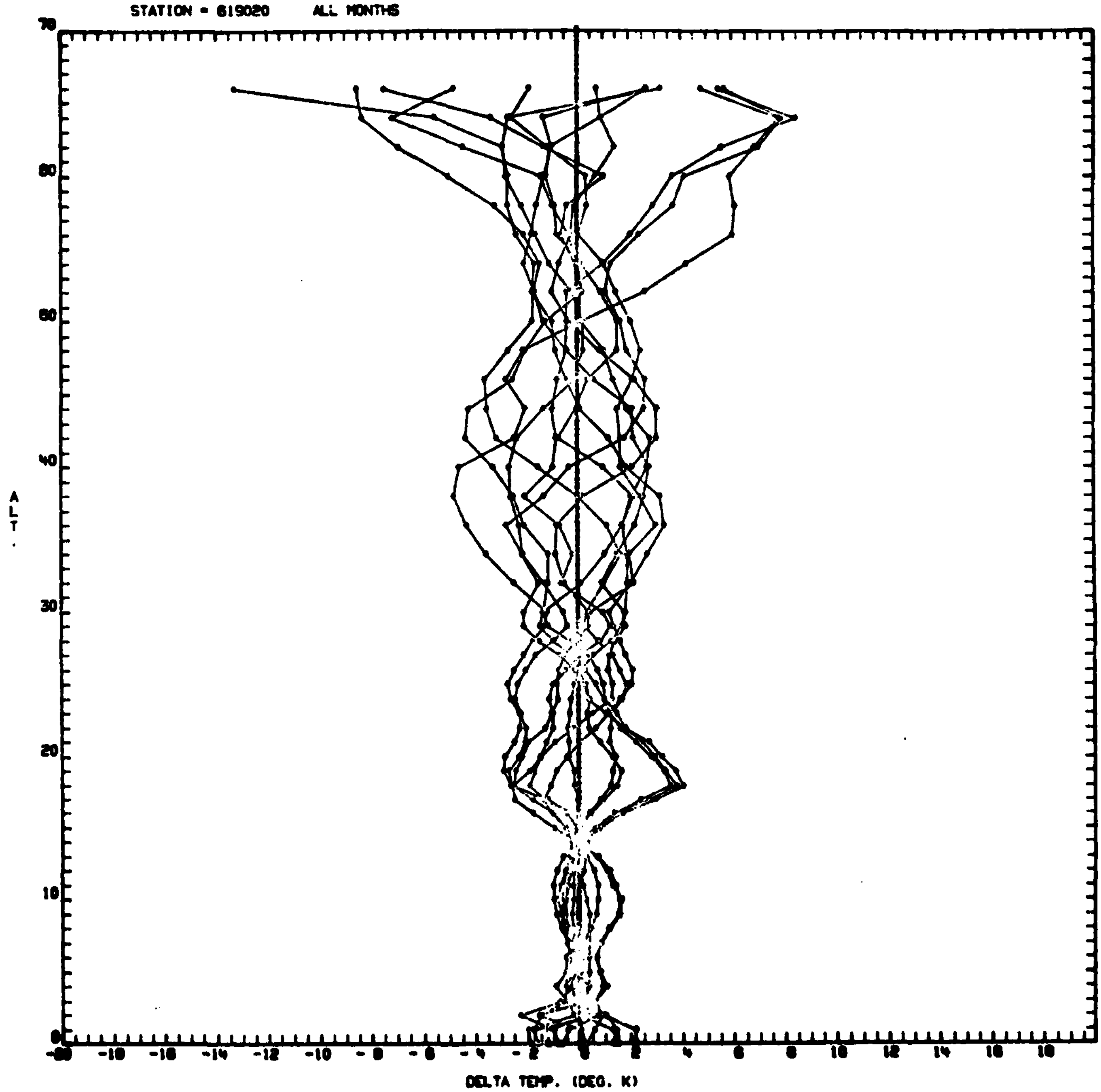


Figure B-12.

Table B-4.

STATION 618020 MONTH 1

LEVEL	CVP	CVD	CVT	R(P,T)	R(P,D)	R(T,D)	DCVP	DCVD	DCVT
.000	.0015	.0054	.0048	-.3471	.5881	-.9833	-.0085	-.0008	-.0023
.020	.0015	.0052	.0045	-.3374	.5809	-.9623	-.0083	-.0008	-.0022
1.000	.0015	.0047	.0045	.0379	.2848	-.9471	-.0076	-.0013	-.0017
2.000	.0016	.0059	.0059	.1006	.1682	-.9638	-.0102	-.0015	-.0016
3.000	.0018	.0041	.0044	.3343	.0711	-.9163	-.0068	-.0020	-.0015
4.000	.0020	.0045	.0046	.2622	.1735	-.9037	-.0071	-.0021	-.0019
5.000	.0021	.0055	.0053	.1210	.2650	-.9251	-.0087	-.0019	-.0023
6.000	.0023	.0052	.0054	.2848	.1456	-.9069	-.0083	-.0024	-.0021
7.000	.0026	.0051	.0056	.4149	.0475	-.6891	-.0082	-.0031	-.0021
8.000	.0029	.0051	.0058	.4773	.0308	-.8636	-.0080	-.0037	-.0022
9.000	.0034	.0058	.0065	.4716	.0459	-.8592	-.0090	-.0041	-.0026
10.000	.0040	.0062	.0071	.4821	.0902	-.8291	-.0093	-.0048	-.0031
11.000	.0045	.0047	.0063	.6723	.0867	-.6938	-.0064	-.0061	-.0029
12.000	.0050	.0047	.0059	.6400	.2834	-.5555	-.0054	-.0062	-.0039
13.000	.0057	.0060	.0062	.4923	.4384	-.5683	-.0065	-.0059	-.0055
14.000	.0061	.0078	.0076	.3652	.4267	-.6861	-.0093	-.0059	-.0063
15.000	.0065	.0094	.0093	.3402	.3573	-.7567	-.0122	-.0065	-.0068
16.000	.0070	.0106	.0102	.2820	.3088	-.7743	-.0138	-.0066	-.0074
17.000	.0074	.0123	.0105	.0824	.5316	-.8003	-.0154	-.0056	-.0093
18.000	.0077	.0150	.0132	.0419	.4750	-.8593	-.0206	-.0059	-.0095
19.000	.0081	.0142	.0133	.1803	.3978	-.8307	-.0195	-.0071	-.0090
20.000	.0087	.0124	.0125	.3023	.3380	-.7502	-.0162	-.0088	-.0086
21.000	.0094	.0106	.0116	.5083	.3351	-.6411	-.0128	-.0104	-.0085
22.000	.0106	.0104	.0107	.5216	.4756	-.5024	-.0106	-.0109	-.0102
23.000	.0112	.0104	.0097	.5118	.6039	-.3756	-.0083	-.0105	-.0120
24.000	.0120	.0132	.0109	.3356	.6326	-.5172	-.0121	-.0097	-.0143
25.000	.0126	.0148	.0116	.2477	.6546	-.5703	-.0138	-.0093	-.0158
26.000	.0130	.0156	.0118	.2178	.6727	-.5758	-.0143	-.0093	-.0168
27.000	.0134	.0156	.0117	.2286	.6837	-.5542	-.0140	-.0094	-.0173
28.000	.0139	.0162	.0113	.1847	.7292	-.5378	-.0136	-.0090	-.0188
29.000	.0143	.0168	.0115	.1710	.7367	-.5404	-.0140	-.0091	-.0136
30.000	.0148	.0164	.0112	.2281	.7474	-.4782	-.0128	-.0096	-.0200
32.000	.0148	.0157	.0138	.3993	.5912	-.5034	-.0147	-.0129	-.0167
34.000	.0168	.0156	.0154	.5301	.5505	-.4160	-.0143	-.0165	-.0170
36.000	.0192	.0176	.0174	.5420	.5533	-.4002	-.0158	-.0190	-.0193
38.000	.0224	.0185	.0204	.6294	.5179	-.3388	-.0165	-.0243	-.0206
40.000	.0258	.0214	.0224	.8121	.5645	-.3072	-.0180	-.0267	-.0248
42.000	.0291	.0233	.0202	.6083	.7255	-.1049	-.0143	-.0260	-.0322
44.000	.0322	.0254	.0178	.6193	.8381	.0906	-.0108	-.0244	-.0399
46.000	.0351	.0280	.0182	.6094	.8578	.1152	-.0111	-.0252	-.0449
48.000	.0383	.0324	.0187	.5332	.8730	.0528	-.0129	-.0246	-.0520
50.000	.0400	.0349	.0229	.4939	.8218	-.0895	-.0178	-.0279	-.0520
52.000	.0427	.0402	.0228	.3744	.8495	-.1711	-.0203	-.0254	-.0600
54.000	.0449	.0416	.0224	.3901	.8882	-.1183	-.0192	-.0257	-.0641
56.000	.0483	.0434	.0245	.4413	.8618	-.0748	-.0197	-.0294	-.0671
58.000	.0527	.0450	.0271	.5198	.8576	.0084	-.0194	-.0348	-.0708
60.000	.0506	.0427	.0320	.5442	.7773	-.1049	-.0241	-.0399	-.0613
62.000	.0534	.0408	.0315	.8492	.8091	.0783	-.0188	-.0442	-.0627
64.000	.0585	.0443	.0336	.6581	.8203	.1093	-.0195	-.0478	-.0691
66.000	.0548	.0406	.0421	.8779	.6484	-.1228	-.0278	-.0583	-.0533

Table B-5.

STATION 619020 MONTH 7

LEVEL	CVP	CVD	CVT	R(P,T)	R(P,D)	R(T,D)	DCVP	DCVD	DCVT
.000	.0014	.0039	.0035	-.1434	.4793	-.9373	-.0060	-.0009	-.0018
.020	.0014	.0038	.0034	-.1495	.4906	-.9350	-.0059	-.0009	-.0018
1.000	.0015	.0039	.0038	.1221	.2611	-.9262	-.0062	-.0014	-.0016
2.000	.0016	.0082	.0082	.1022	.0921	-.9311	-.0148	-.0016	-.0016
3.000	.0018	.0056	.0058	.1505	.1728	-.9478	-.0094	-.0018	-.0018
4.000	.0020	.0056	.0056	.1951	.1611	-.9365	-.0092	-.0020	-.0020
5.000	.0022	.0053	.0054	.2701	.1341	-.9179	-.0085	-.0023	-.0020
6.000	.0025	.0053	.0055	.3088	.1523	-.8930	-.0082	-.0027	-.0023
7.000	.0027	.0057	.0059	.2998	.1661	-.8910	-.0089	-.0029	-.0025
8.000	.0031	.0062	.0066	.3733	.0982	-.8865	-.0097	-.0035	-.0026
9.000	.0035	.0064	.0072	.4521	.0369	-.8747	-.0101	-.0042	-.0027
10.000	.0040	.0063	.0073	.5134	.0437	-.8321	-.0095	-.0051	-.0030
11.000	.0046	.0045	.0062	.6814	.0933	-.6652	-.0061	-.0062	-.0030
12.000	.0052	.0045	.0057	.6703	.3013	-.5056	-.0050	-.0065	-.0039
13.000	.0058	.0053	.0064	.6273	.3368	-.5221	-.0059	-.0070	-.0047
14.000	.0064	.0069	.0068	.4559	.4783	-.5636	-.0073	-.0063	-.0065
15.000	.0069	.0080	.0074	.3751	.5154	-.6010	-.0085	-.0063	-.0075
16.000	.0073	.0091	.0073	.2187	.6207	-.6294	-.0092	-.0055	-.0090
17.000	.0075	.0127	.0094	-.1053	.6733	-.8062	-.0148	-.0043	-.0108
18.000	.0078	.0145	.0117	-.0726	.5950	-.8448	-.0184	-.0050	-.0106
19.000	.0079	.0145	.0115	-.0787	.6077	-.8396	-.0181	-.0050	-.0108
20.000	.0077	.0132	.0106	-.0261	.6022	-.8138	-.0161	-.0050	-.0104
21.000	.0077	.0126	.0102	.0272	.5879	-.7927	-.0152	-.0053	-.0101
22.000	.0081	.0127	.0107	.1071	.5490	-.7723	-.0153	-.0061	-.0101
23.000	.0083	.0114	.0103	.2587	.4924	-.7134	-.0134	-.0071	-.0094
24.000	.0089	.0117	.0109	.3068	.4675	-.6981	-.0138	-.0080	-.0097
25.000	.0087	.0115	.0105	.2811	.4828	-.6091	-.0133	-.0077	-.0090
26.000	.0092	.0115	.0102	.3027	.5314	-.6405	-.0125	-.0079	-.0105
27.000	.0097	.0110	.0101	.3758	.5323	-.5845	-.0115	-.0087	-.0106
28.000	.0101	.0099	.0093	.4702	.5736	-.4442	-.0091	-.0095	-.0108
29.000	.0104	.0110	.0094	.3928	.6101	-.4809	-.0100	-.0089	-.0118
30.000	.0110	.0122	.0102	.3288	.6216	-.5354	-.0115	-.0089	-.0130
32.000	.0150	.0176	.0208	.5566	.1963	-.7054	-.0234	-.0182	-.0118
34.000	.0190	.0169	.0224	.6781	.2282	-.5625	-.0202	-.0245	-.0135
36.000	.0228	.0150	.0174	.7513	.8440	-.0211	-.0097	-.0252	-.0204
38.000	.0261	.0197	.0173	.6591	.7506	-.0021	-.0108	-.0238	-.0285
40.000	.0293	.0219	.0194	.6634	.7489	.0009	-.0120	-.0268	-.0318
42.000	.0325	.0258	.0174	.6094	.8453	.0914	-.0108	-.0240	-.0409
44.000	.0345	.0335	.0183	.3207	.8548	-.2177	-.0173	-.0194	-.0498
46.000	.0358	.0358	.0202	.2853	.8403	-.2800	-.0202	-.0203	-.0514
48.000	.0377	.0363	.0222	.3566	.8214	-.2399	-.0207	-.0238	-.0519
50.000	.0418	.0381	.0208	.4195	.8889	-.0849	-.0170	-.0245	-.0591
52.000	.0437	.0401	.0191	.3989	.8998	-.0411	-.0155	-.0227	-.0648
54.000	.0456	.0432	.0198	.3353	.9016	-.1051	-.0174	-.0223	-.0690
56.000	.0474	.0448	.0204	.3380	.9035	-.0971	-.0178	-.0230	-.0717
58.000	.0514	.0449	.0265	.4695	.8570	-.0298	-.0200	-.0331	-.0698
60.000	.0582	.0525	.0320	.4447	.8377	-.1186	-.0263	-.0377	-.0787
62.000	.0673	.0589	.0320	.4846	.8800	.0110	-.0235	-.0404	-.0942
64.000	.0778	.0687	.0412	.4727	.8490	-.0644	-.0321	-.0503	-.1054
66.000	.1097	.0997	.0640	.4414	.8171	-.1586	-.0540	-.0741	-.1484

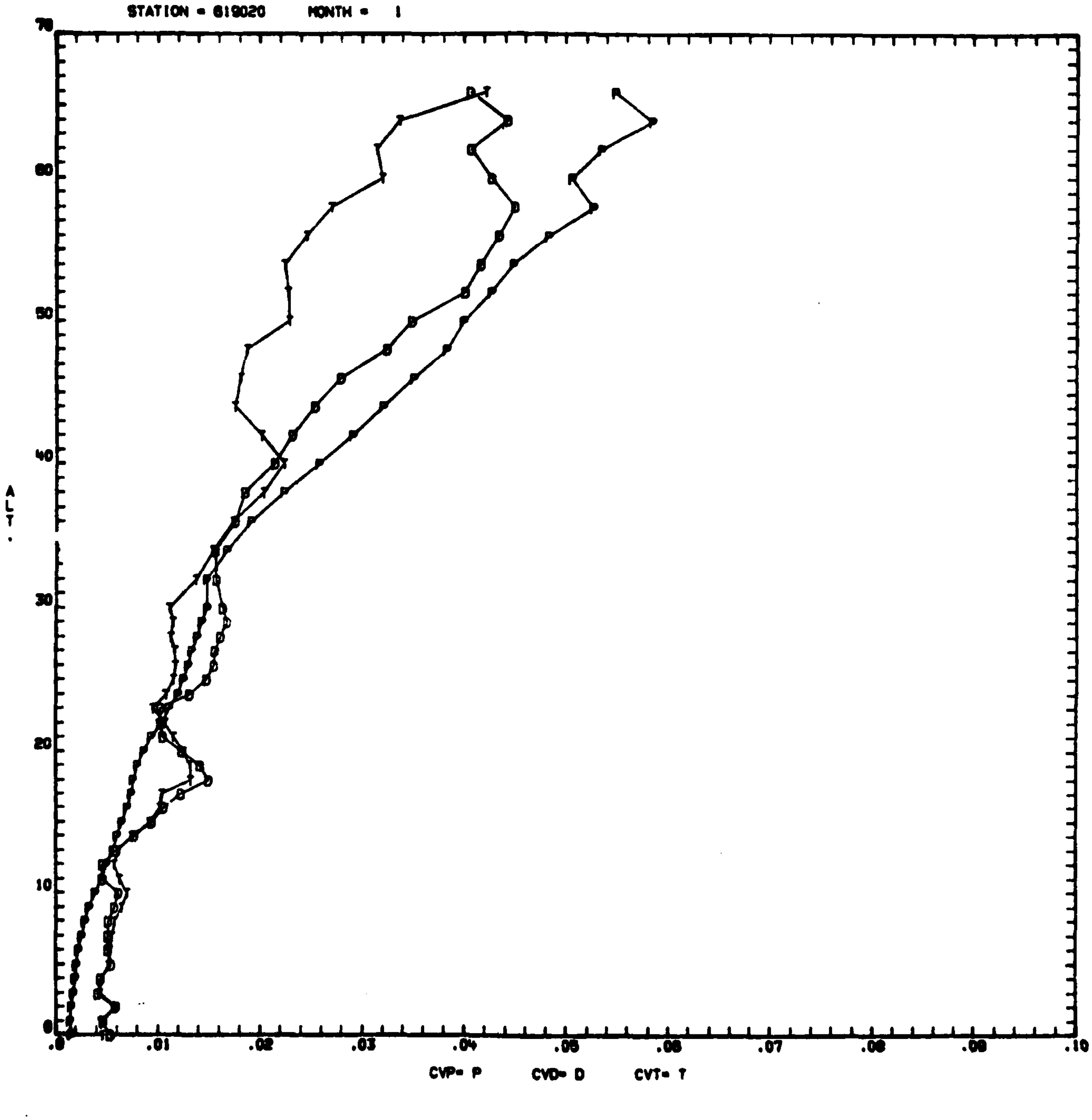
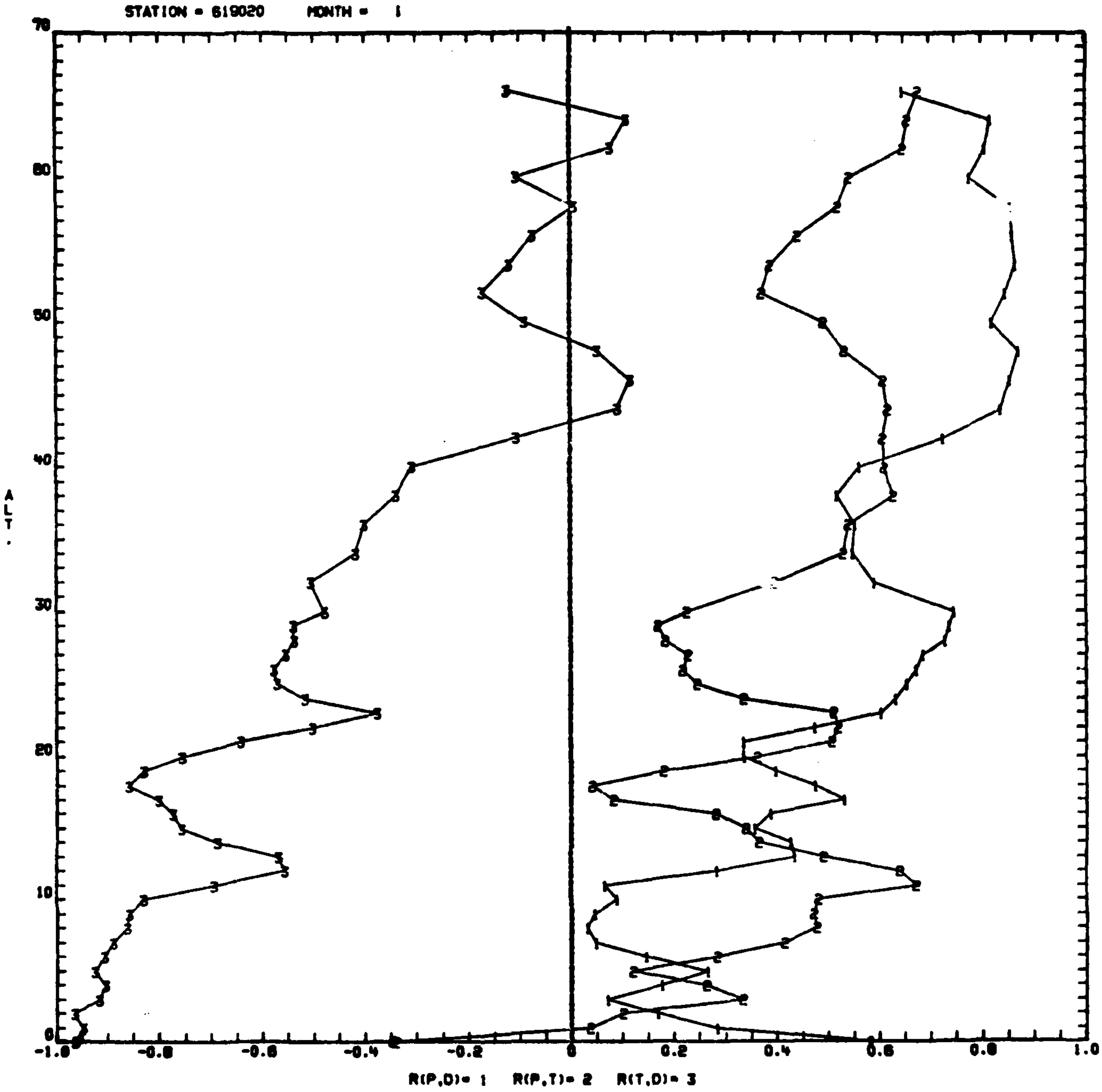


Figure B-13.



STATION = 619020   MONTH = 1
70
60
50
40
30
20
10
0
A
L
T
.
-1.0
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1.0
R(P,D)= 1   R(P,T)= 2   R(T,D)= 3

Figure B-14.

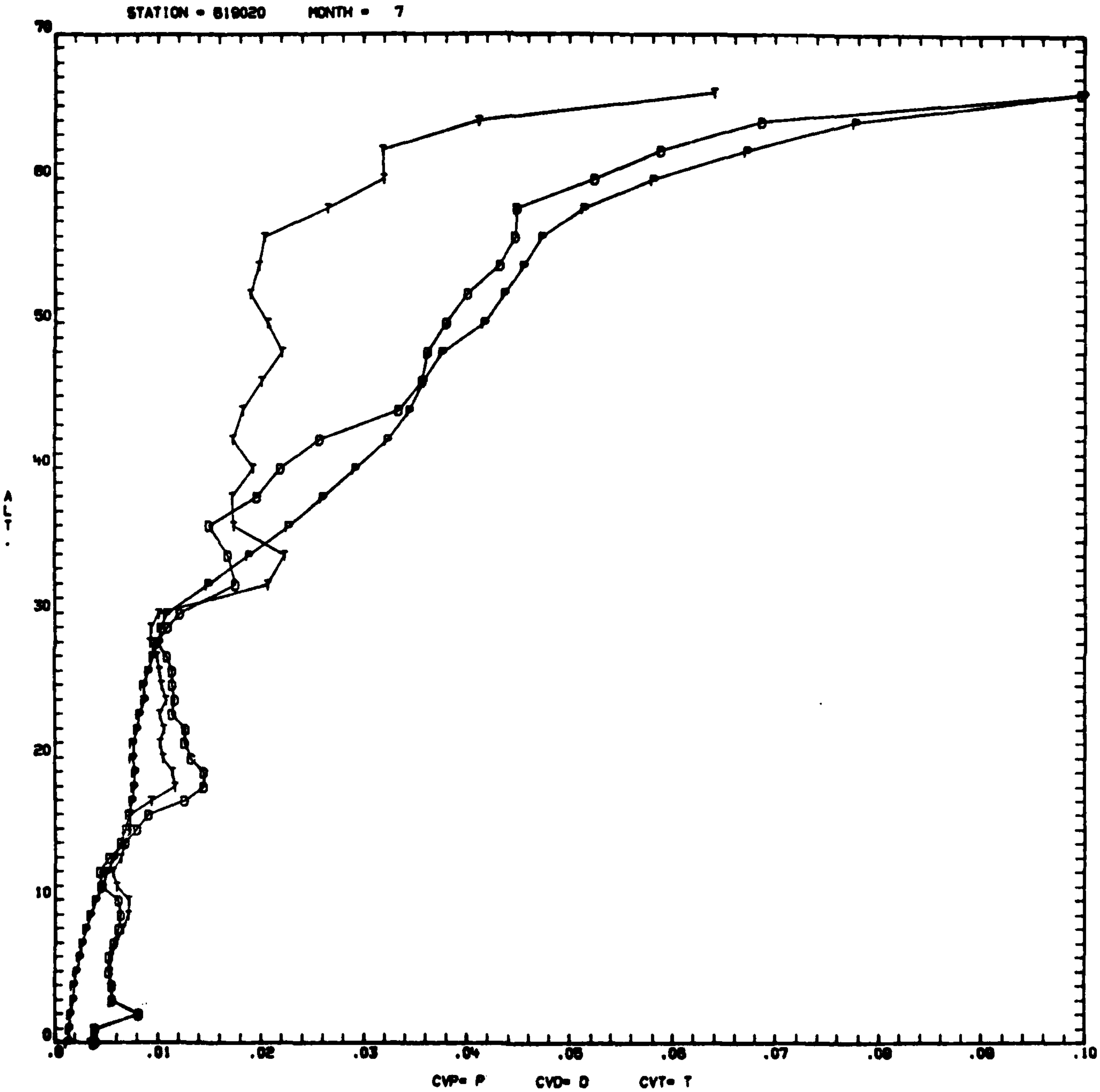


Figure B-15.

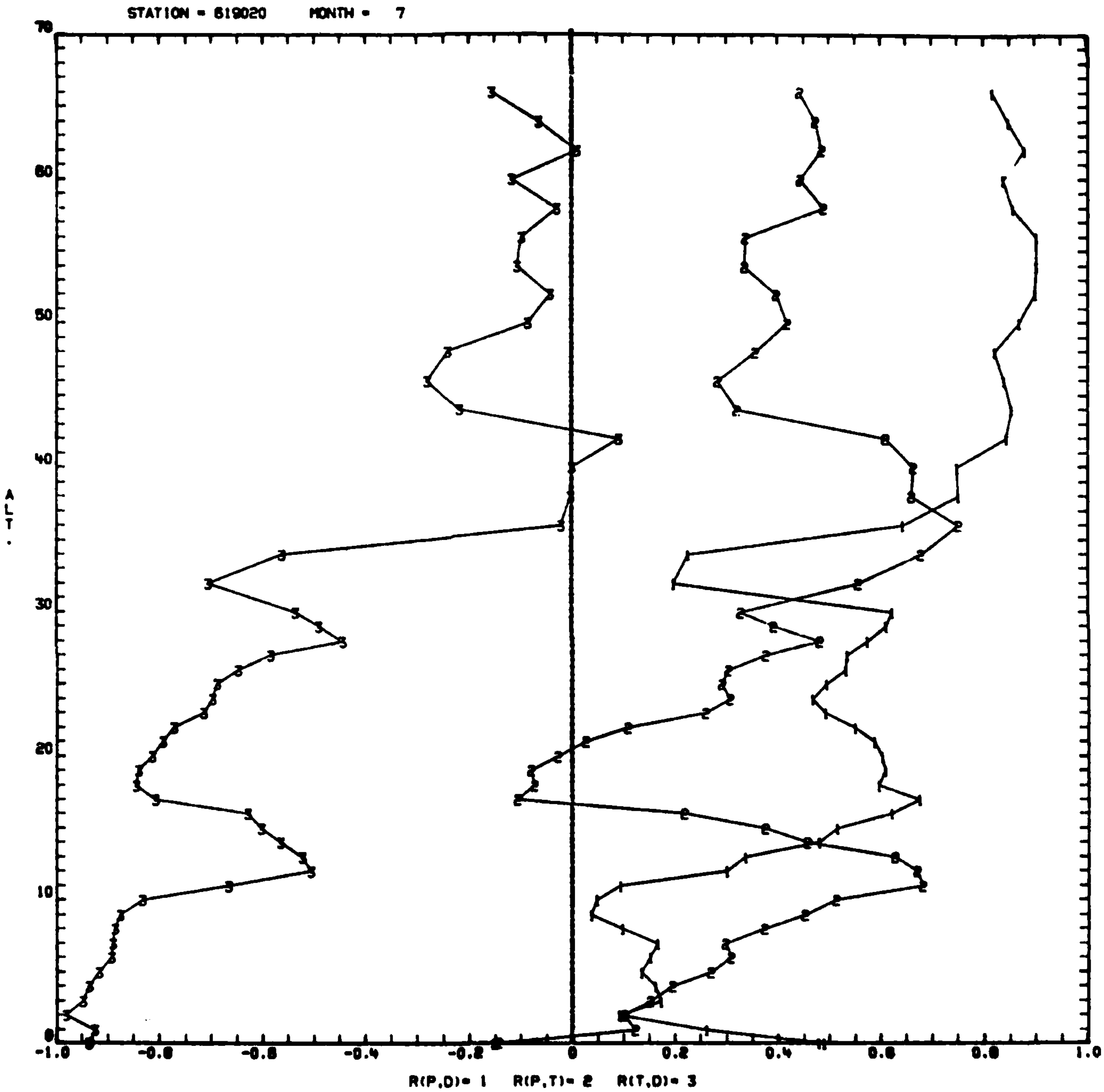


Figure B-16.

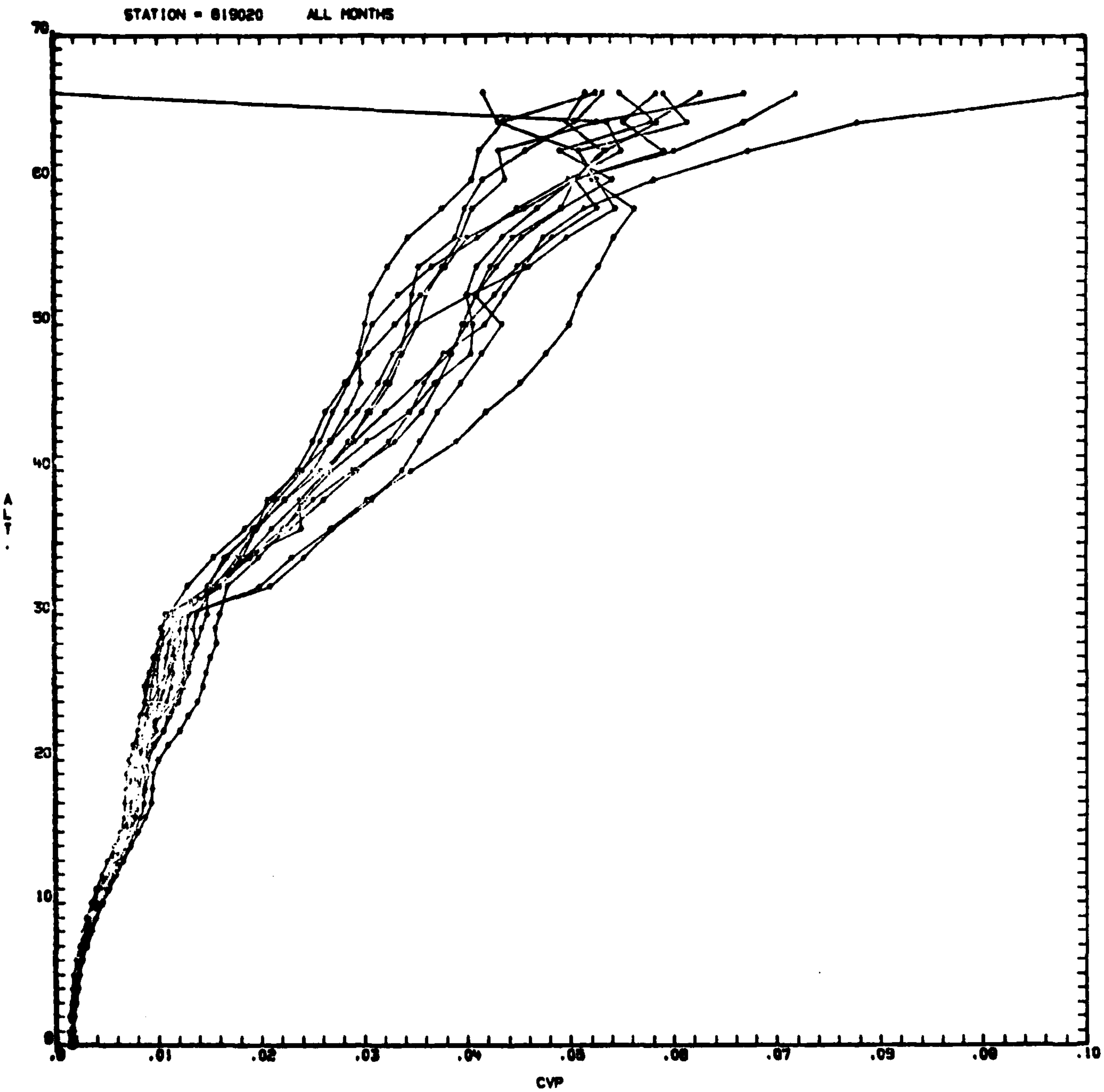

STATION = 819020 ALL MONTHS
70
60
50
40
30
20
10
0
A
L
T
.
.0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.10
CVP

Figure B-17.

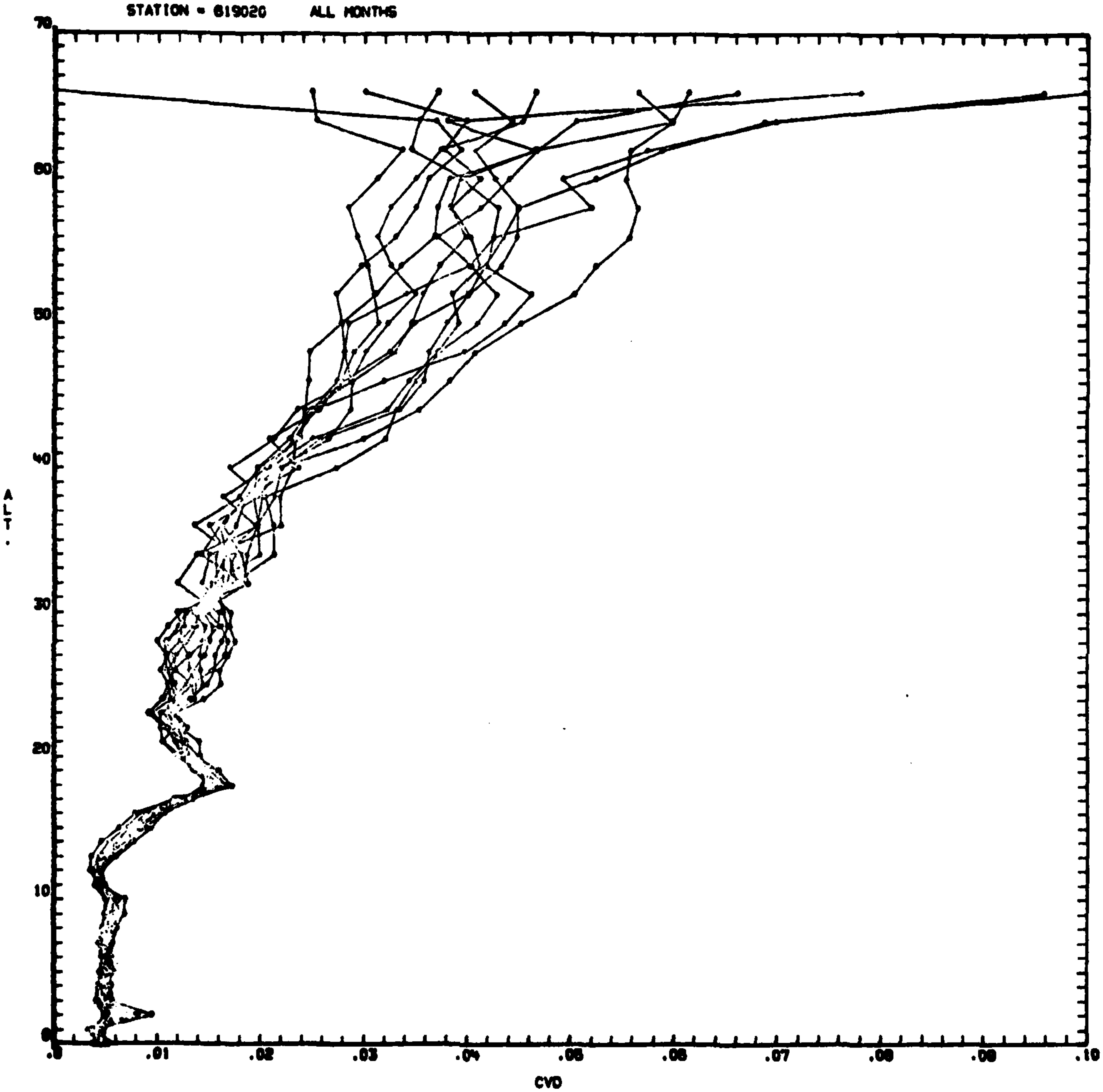

STATION = 619020 ALL MONTHS
ALT.
CVD
.0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.10
0
10
20
30
40
50
60
70

Figure B-18.

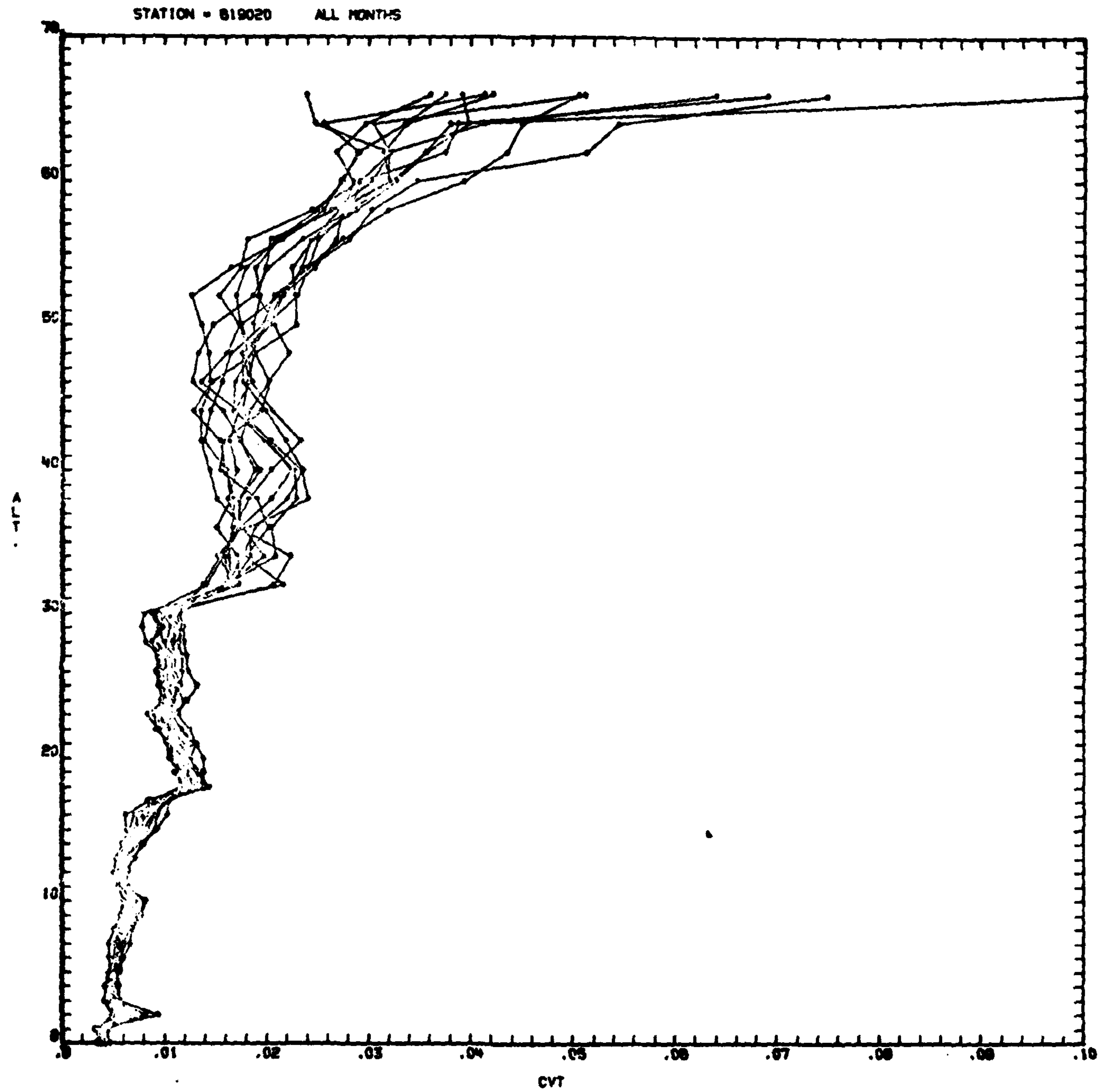
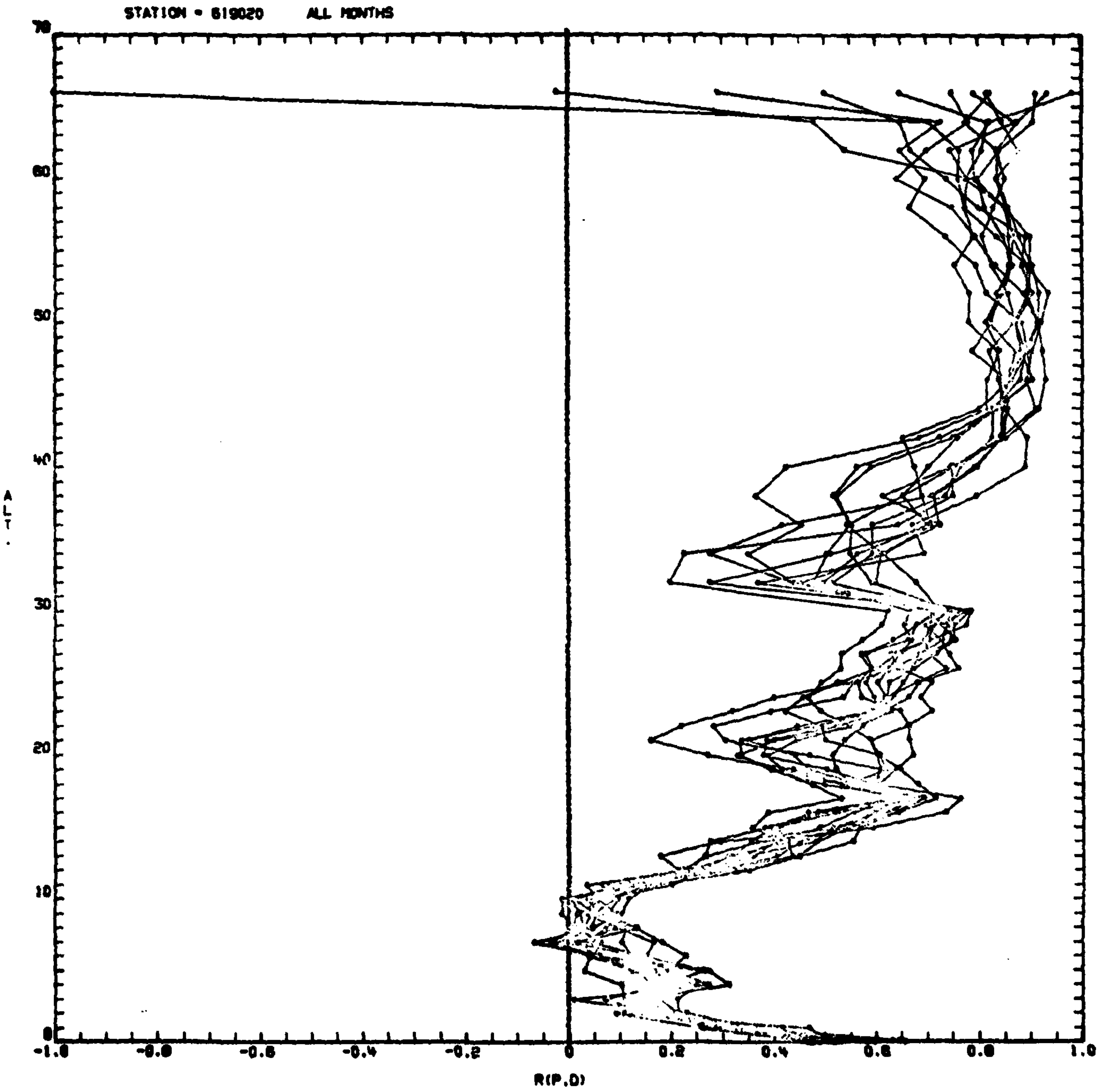
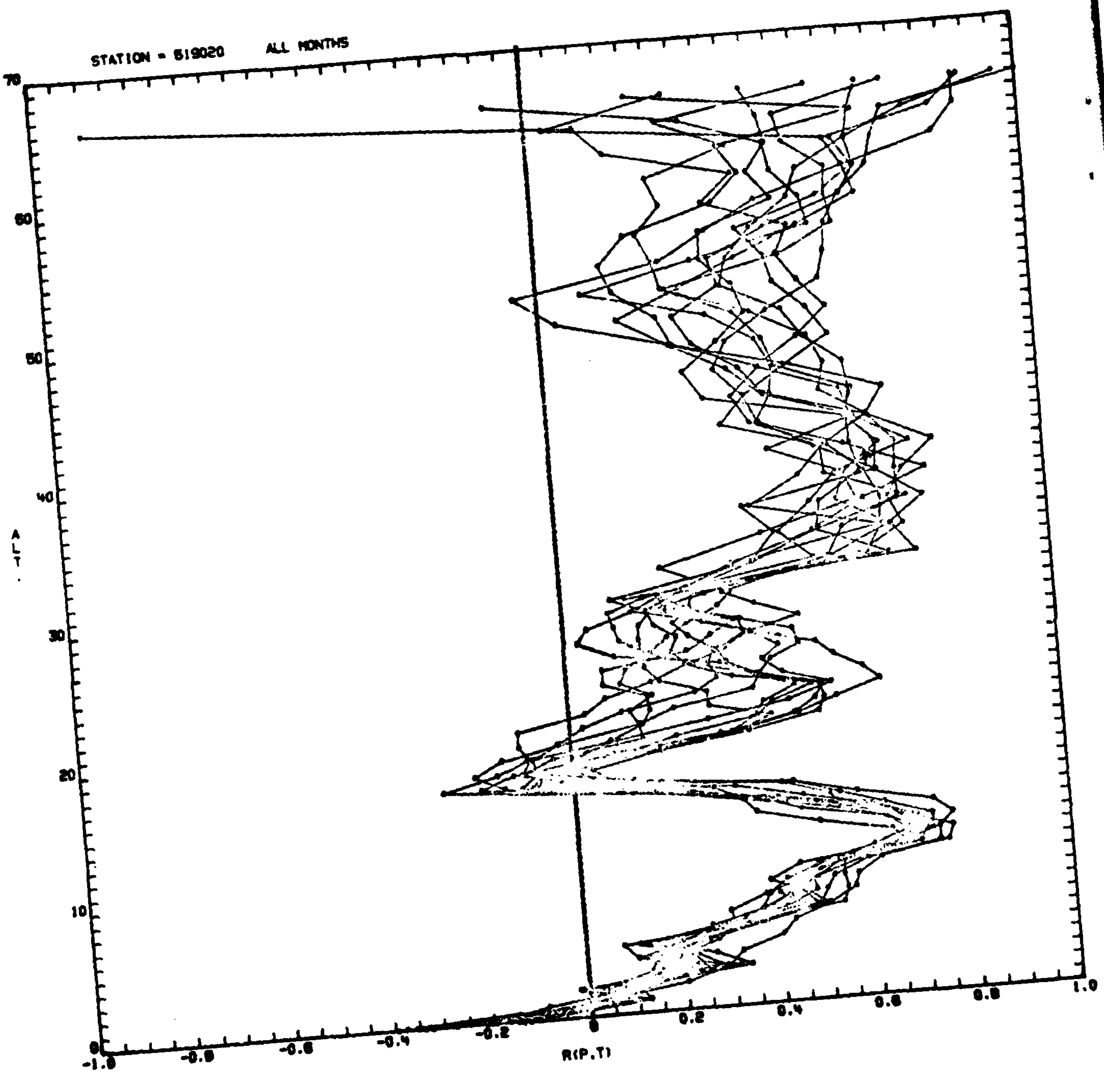

STATION = 819020 ALL MONTHS
70
60
50
40
30
20
10
0
ALT.
.0
.01
.02
.03
.04
.05
.06
.07
.08
.09
.10
CVT

Figure B-19.



STATION = 619020 ALL MONTHS
70
60
50
40
30
20
10
0
A
L
T
.
-1.0
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1.0
R(P,D)

Figure B-20.



STATION = 519020 ALL MONTHS
70
60
50
40
30
20
10
0
ALT.
-1.0
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1.0
R(P,T)

Figure B-21.

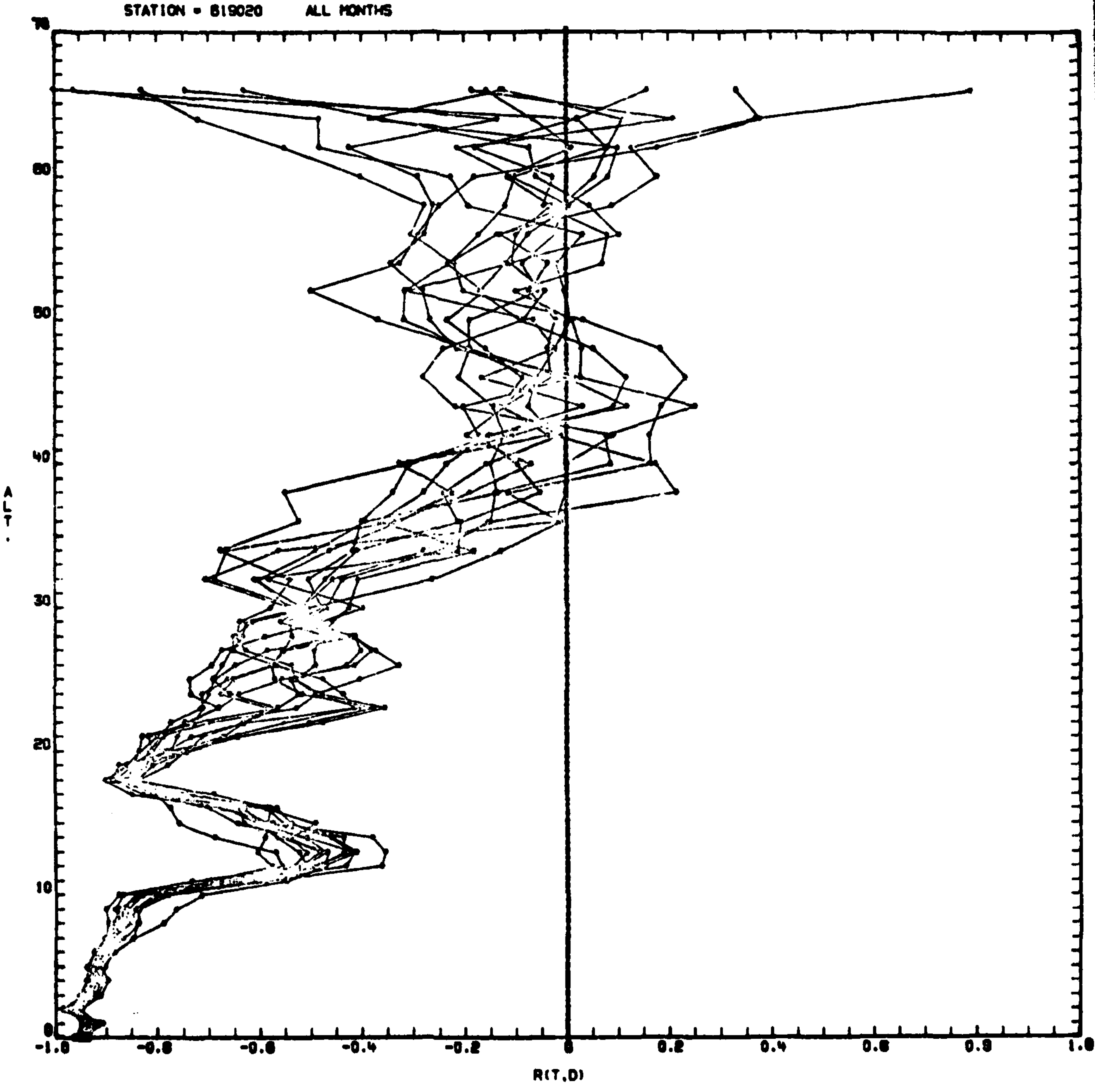

STATION = 619020 ALL MONTHS
70
60
50
40
30
20
10
0
A
L
T
.
-1.0
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1.0
R(T,D)

Figure B-22.